# BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

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BURTON E. LIVINGSTON, Editor-in-Chief
The Johns Hopkins University, Baltimore, Maryland

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## AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

1. ÅKERMAN, Å. **Något om resultaten av de senare årens lokala sortförsök. [Concerning the results of local variety tests in recent years.]** Sver. Utsädesf. Tidskr. 29: 157–162. 1919.

2. ALTMANNSBERGER, [——]. **Qualitativ und quantitativ Steigerung der Erträge im Zuckerrübenbau durch Kalidüngung. [Qualitative and quantitative increase in the yield of sugar beets by applying potash to the soil.]** Illustr. Landw. Zeitg. 39: 463. 1919.—A brief, popular, article recommending potash as a fertilizer for sugar-beets.—*John W. Roberts.*

3. ANONYMOUS. **Protection of potatoes from cold in transit—lining and loading cars.** U. S. Dept. Agric. Farmers' Bull. 1091. *27 p., 22 fig.* 1920.

4. AZZI, G. **Der agrikultur-meterologiska problemet. [The agricultural-meteorological problem.]** Sver. Utsädesf. Tidskr. 29: 207–220. 1919.—Review of the problems confronting agricultural meteorology, methods of attack, and the value of meteorology to agriculturists and plant breeders.—*E. G. Anderson.*

5. BOLIN, PEHR. **På resultat av lokala fältförsök grundade jämförelser mellan några sädessorter av större betydelse. [On the result of local field test comparisons between some of the more important varieties of grain.]** K. Landtbr. Akad. Handl. och Tidskr. 58: 253–281. 1919.—Compiled results of comparative yield tests of the more prominent varieties of rye, wheat, oats, and peas. These tests were made under field conditions in various parts of Sweden, a number of the tests extending over the period of years from 1912 to 1918. Summary tables only are included.—*E. G. Anderson.*

6. BREAKWELL, E. **Popular description of grasses. The Chloris grasses.** Agric. Gaz. New South Wales 31: 309–314. *Fig. 1–4.* 1920.—*Chloris truncata, C. acicularis* and *C. ventricosa,* native species, are described and illustrated.—*L. R. Waldron.*

7. BRIGGS, GLEN. **Guam corn.** Jour. Amer. Soc. Agron. 12: 149–157. 1920.—An historical record and a general discussion of corn in the island of Guam. Introduction was made from Mexico about 250 years ago.—*F. M. Schertz.*

8. Carrier, Lyman. **The history of the silo.** Jour. Amer. Soc. Agron. 12: 175–182. 1920.—Silos or hermetically sealed grain pits were first used in the dry Mediterranean countries before the Christian era. Egyptian, Spanish, American Indian, Roman, German, French and American types of silos are discussed. The silo in America is especially emphasized.—*F. M. Schertz.*

9. Chodat, R. **Études faites au jardin alpin de la "Linnaea." 1. Sur quelques faits de botanique et de geographie economique a Bourg-Saint-Pierre. [Observations made at the "Linnaea" alpine garden. 1. Concerning certain things of economic value related to botany and geography at St. Pierre.]** Bull. Soc. Bot. Genève 11: 30–41. 1919.—A general description of the mountainous country at St. Pierre (France) is accompanied by a list of wild and cultivated plants that are used for food or medicine.—*W. H. Emig.*

10. Coombs, G. E. **Notes on economic botany during 1918.** Agric. Bull. Federated Malay States 7: 86–88. 1919.—Brief notes on rice culture, green manures, rubber, and coconuts.—*E. D. Merrill.*

11. Damon, S. C. **A five-year rotation of potatoes, rye straw and squashes, onions, oats and rowen, and hay.** Rhode Island Agric. Exp. Sta. Bull. 178. *15 p.* 1919.—The results of the first 24 years are recorded. Every crop in the rotation was grown each year. Stable manure was used only on the squashes; fertilizer on the other crops. There is a comparison of the fertilizer ingredients added, with those removed in the crop; and a discussion of the financial returns.—*B. L. Hartwell.*

12. Derlitzki, [——]. **Zur Sorten und Saatgutfrage der Wintergerste. [Concerning winter-barley varieties and seed.]** Illustr. Landw. Zeitg. 39: 312–313. *Fig. 245–247.* 1919.—A short, popular discussion of winter-barley varieties from the growers point of view.—*John W. Roberts.*

13. Greve, W. **Ratschläge zur Bekämpfung der Ackerunkräuter. [Advice as to the control of farm weeds.]** Illustr. Landw. Zeitg. 39: 200–202. *Fig. 149–161.* 1919.—A popular discussion of the subject. Cultivation, selection of pure seed, drainage, applications of iron sulphate, kainit, and calcium nitrate are the prinicpal measures advocated for the control of various weeds.—*John W. Roberts.*

14. Harris, F. S., and Butt, N. I. **The unreliability of short time experiments.** Jour. Amer. Soc. Agron. 12: 158–167. 1920.—Data from experiments with potatoes, sugar beets, alfalfa, corn, oats, and wheat show that short-time experiments are subject to error where a complete cycle of seasonal fluctuations is not included. Experiments conducted at Logan, Utah, show that the divergence varies in different years. Manuring experiments have wider variations from the average than irrigation experiments. Under dry farming conditions variations are wider than under irrigation conditions and small irrigations vary more than where the optimum amount of water is supplied. Potatoes varied most in yield and were followed by sugar beets, alfalfa, corn, oats, and wheat, in order. Experiments requiring personal judgment vary more than those requiring only mechanical measurements.—*F. M. Schertz.*

15. Hartwell, Burt L. **Thirty-first annual report of the Director of the Rhode Island Agricultural Experiment Station.** Rhode Island State Coll. Bull. 14: 57–65. 1919.—The report is for 1918 and gives brief statements of the results of the experiments, grouped in part under the following headings: organic matter for the soil; efficiency of fertilizers and other manures; specific plant differences and needs; effect of crops on each other; inheritance studies with poultry and rabbits.—*B. L. Hartwell.*

16. Hartwell, Burt L., and S. C. Damon. **A field comparison of hydrated lime with limestone of different degrees of fineness.** Rhode Island Agric. Exp. Sta. Bull. 180. *18 p.* 1919.—During the year of application, 80-mesh limestone had the same effect as an equivalent

amount of hydrated lime; and the percentage of this grade in the 10-mesh limestone represented approximately the first season's efficiency of the calcium oxide equivalent in the limestone as compared with that in hydrated lime. During the 5 years following the single application, the average results were slightly in favor of the hydrated lime—Four crops were grown in each of 5 years on the same plat sections to ascertain their cumulative effect on a single crop of barley grown over the entire area in the field, and on lettuce grown in pots. Arranged in a decreasing series, the order of the crops was the same in accordance with their need for lime, and also their cumulative effect in enhancing acid-soil conditions. The order is as follows: Mangels, carrots, alfalfa, and barley. Where the acidity was reduced by liming, the four crops affected a succeeding crop about uniformly.—*B. L. Hartwell.*

17. HARTWELL, BURT L., AND S. C. DAMON. **The value of sodium when potassium is insufficient.** Rhode Island Agric. Exp. Sta. Bull. 177. *29 p.* 1919.—Field results are reported for 1905 to 1918, of an experiment which was begun in 1894 to ascertain the value of sodium as a partial substitute for potassium. Both elements have been applied in carbonates and in chlorids in connection with two different rates of liming. Nitrogen and phosphorus were added liberally and alike to all plats. Sodium was generally useful where there was an insufficiency of potassium.—Some of the benefits arising from the use of sodium in the field are attributable to indirect action; but solution culture indicates that direct beneficial effects were probably obtained also in the field.—*B. L. Hartwell.*

18. HARTWELL, BURT L., F. R. PEMBER, AND G. E. MERKLE. **The influence of crop plants on those which follow. II.** Rhode Island Agric. Exp. Sta. Bull. 176. *47 p.* 1919.—Five different crop plants were grown for two or three successive years in pots containing the same soil and then followed by a single crop plant. In case of each crop, uniform fertilizer series were maintained with super-optimum nutrients, with optimum nutrients, and with the latter from which potassium, nitrogen and phosphorus were individually omitted.—When onions constituted the single crop, the yields of onions increased after the crops in about the following order: Buckwheat, mangels, rye, onions, and redtop. Subsequently, when buckwheat was the single crop, its yield increased after the crops arranged about as follows: Redtop, buckwheat, mangels, rye, and onions. The relative effect of the different crops varied somewhat, depending upon the fertilizer treatment, but not as much as would be expected generally.—The divergent effect of crops on those which follow seems not to be attributable, at least principally, to differences in the amount of nutrients removed by the crops grown previously; that is, the smallest yield may not occur after the crop which removes the largest amount of even the most-needed nutrients.—The change which a given application of a nutrient causes in its percentage in the crop depends not only upon its own effect on the rate of growth, but also upon the abundance of the other nutrients in relation to the needs of the crop.—So-called soil acidity was affected differently by the several crops, and their influence on succeeding crops was much less pronounced after thorough liming.—*B. L. Hartwell.*

19. HIBBARD, R. P. **Seed potato preparation.** Michigan Agric. Exp. Sta. Quart. Bull. 2: 176–178. *Fig. 5.* 1920.—Reports a small experiment on sprouting of seed pieces of various sizes and effect in yield of size of seed pieces. Pieces with but one eye gave 61 per cent sprouting, with 2 or more eyes 100 per cent sprouting. Whole tubers averaging 4.6 ounces gave a yield of 9 per cent more than the yield from seed pieces averaging 1.4 ounces.—*E. A. Bessey.*

20. HODSON, EDGAR A. **Correlations of certain characters in cotton.** Arkansas Agric. Exp. Sta. Bull. 169. *16 p.* June, 1920.—Correlation coefficients have been worked out for a large number of physical characters of cotton and are reported in this publication. The coefficients do not indicate as high a correlation in many cases as has popularly been supposed to exist. There is, however, a very consistent negative correlation between per cent of lint and length of lint, a high positive correlation between weight of seed and size of boll, etc.—*Edgar A. Hodson.*

21. Jenkins, E. H., and G. P. Clinton. **Fertilizer experiments with potatoes.** Connecticut [New Haven] Agric. Exp. Sta. Bull. 214: 421–422. 1917 and 1918.—This is a series of observations on the yields of potatoes as affected by different fertilizers, especially potash. A 4–8–4 and a 2–9–4 each on duplicate plots gave rather uniform yields in 1917. The addition of 1000 pounds wood ashes to the Essex 4–10–0 fertilizer increased the yield somewhat in one case, but was without effect in another. The addition of 2000 pounds wood ashes to the same fertilizer increased the yield somewhat in the first case and in a more pronounced degree in the second. The ashes induced scab. The 4–10–0 fertilizer in 1917 gave as good yields as 4–8–4 when each was applied at the rate of 1000 pounds per acre. In 1918 on other land a 3–8–3 formula in comparison with a 4–10–0 formula each applied at the rate of 1800 pounds—800 pounds before the first harrowing, 400 pounds in the planter and 600 pounds at the second cultivation—gave 50 bushels the greater yield for the potash.—*Henry Dorsey.*

22. Juhlin-Dannfelt, H. **Översikt av ogräslagstiftningen i utlandet. [Review of weed legislation in foreign countries.]** K. Landtbr. Akad. Handl. och Tidskr. 58: 166–174. 1919.—Summary of laws affecting weeds and weed control in European countries, United States, Canada, and Australia.—*E. G. Anderson.*

23. Kiessling, L. **Die Leistungen der Wintergerste und deren Züchterische Beeinflussung. [The yields of winter barley and their significance in breeding experiments.]** Illustr. Landw. Zeitg. 39: 310–311. 1919.—A popular discussion, the importance of the subject being emphasized. The writer's own experiments, carried on since 1911, gave no positive results.—*John W. Roberts.*

24. Kleberger, [——]. **Die wissenschaftliche und praktische Bedeutung der Prüfung des Anbauwertes unserer Oelpflanzen. [The scientific and practical significance of the testing of the agricultural value of our oil-producing plants.]** Illustr. Landw. Zeitg. 39: 249–250. 1919.—The writer discusses chiefly the possible financial returns which may be obtained from the culture of oil-producing plants.—*John W. Roberts.*

25. Kling, M. **Die Düngung des Tabaks. [The fertilization of tobacco.]** Illustr. Landw. Zeitg. 39: 473–474. 1919.—The tobacco plant needs a rather large amount of potash, but should receive as little chlorine as possible. It is well, therefore, to grow tobacco after beets. Crude potash salts should not be used. Stable manure comes first as a fertilizer for tobacco and should be used at the rate of 600 Dz. per hectare. Usually it should be applied in the autumn, but on light soils half should be applied in the spring and half in the autumn. Potassium sulphate at the rate of 4 Dz. per hectare should be applied in the spring. Usually 70 kgm. of ammonium sulphate or better, 35–40 kgm. of urea per hectare are needed. When stable manure is used, phosphoric acid is not necessary. Too much phosphoric acid causes early maturity and poor quality. Calcium should be applied to soils in which it is lacking.—*John W. Roberts.*

26. Lenart, G. H. **Neue Verarbeitungsweise der Zichorie. [New manufactured products from chicory.]** Illustr. Landw. Zeitg. 39: 479–480. 1919.—The new products are: (1) inulin, from which levulose and a liquid sugar-dye are obtained; (2) chicory sirup, from which may be obtained a coffee substitute, a sugar-dye in dry form, and alcohol; (3) dry shreds, which may be used as feed for animals.—*John W. Roberts.*

27. Maiden, J. H. **Chats about the prickly pear.** Agric. Gaz. New South Wales 31: 325–332. *4 fig.* 1920. Discusses the use of *Opuntia* spp. as a feed for stock.—*L. R. Waldron.*

28. Mundy, H. G. **Improvement of Rhodesian pastures.** Rhodesia Agric. Jour. 17: 113–117. *4 pl.* 1920.—Encouraging results have been obtained with grasses indigenous to Africa, which have in general proved more successful than exotic species.—*E. M. Doidge.*

29. Neumeister, [——]. **Die Verwendung des Ammoniak—Superphosphats als Kopfdünger zu Winterroggen. [The use of ammonium superphosphate as the chief fertilizer for winter rye.]** Illustr. Landw. Zeitg. 39: 145–146. 1919.—As the result of three experiments in the use of fertilizers for winter rye, the author considers ammonium superphosphate to be promising as chief fertilizer. Additional experiments are being carried on.—*John W. Roberts.*

30. Pantanelli, E. **Utilizzazione della cannarecchia o sorgagna. [Utilization of Johnson grass.]** Staz. Sper. Agr. Ital. 52: 405–415. *Pl. IX.* 1919.—A short note designed to draw attention to the possibility of utilizing *Sorghum halepense* (L.) Pers. in the agricultural explorations of dry countries. The plant is stated to be indigenous in Italy, but it has not been considered as an agricultural crop up to the present time. Its utilization in America, however, shows its great possibilities for this purpose.—*A. Bonazzi.*

31. Piper, C. V., and Lyman Carrier. **Carpet grass.** U. S. Dept. Agric. Farmers Bull. 1130. *12 p. 5 fig.* 1920.—Carpet grass (*Axonopus compressus* (Swartz) Schlecht.) the most important grass for permanent pasture in the Coastal Plain area of the South. Is not a native, but was accidentally introduced from tropical America before 1830 and has spread generally over the Southern States. The plant requires a moist or at least not droughty soil and succeeds better in such soils if sandy than any other pasture grass. The minimum temperature it will survive is about 10°F. Carpet-grass pastures are readily established in tilled land by seeding at any time from early spring to late summer on a well-firmed seed bed, when moisture conditions are favorable. On unbroken or stump land good results can be secured by burning or mowing the tall native grasses, seeding at a favorable time, and then pasturing to keep the native bunch grasses constantly short. Under this treatment the native grasses are eradicated in one or two years and replaced by a pure stand of carpet grass. The carrying capacity of good carpet-grass pasture is one cow to the acre for the five best months and one cow to 2 acres for 3 to 5 months longer. Dallis grass, lespedeza, white clover, bur clover, black medic, and Augusta vetch are desirable in mixture with carpet grass. Italian rye may be used as a winter mixture, but needs to be sown each fall. Under some conditions redtop should be used to precede carpet grass. Carpet-grass pastures should be grazed to their capacity, as under heavy grazing the best condition is maintained. Bitterweed and dog fennel are the only two weeds that seriously invade carpet-grass pastures. During the first two seasons these weeds should be mowed before they ripen seeds. Thereafter they will cause but little trouble, but mowing should be resorted to when necessary. Seed of carpet grass is easily harvested by mowing and thrashing. Large areas of pure or nearly pure carpet grass occur in several regions in the South. Up to the present the quantity of seed produced has been only a fraction of that required. A comprehensive plan has been devised to increase greatly the harvesting of seed, as the outstanding need to stimulate a much greater use of carpet grass for pasture is an ample seed supply.—*Authors' summary.*

32. Roberts, Herbert F. **Yellow-berry in hard winter wheat.** Jour. Agric. Res. 18: 155–169. 1919.—Opaque, starchy spots in wheat kernels, which give rise to the name "yellow-berry," almost invariably appear near the embryo, the proximal end of the kernel, and spread from there upward. Seventy-seven pure lines of wheat were grown in comparison with 87 lots of a standard variety, Kharkov, to determine the relation of yellow-berry to field conditions, especially with reference to the period between first heading and ripening.—The operation of common causes for the production of yellow-berry overshadows any differences that may be due to hereditary tendencies and preclude a definite statement regarding the relation of hereditary tendencies in hard winter wheat toward the production of yellow-berry. "That some isolated pure strains of wheat are freer from yellow-berry than others growing in the same field and apparently under identical conditions of soil and climate is, however, possible." The percentage of yellow-berry is higher with the later dates of ripening. Starch grains in the yellow-berry portion of a kernel are smaller than those in the flinty part. Yellow-berry kernels average 0.4 mgm. heavier than flinty kernels; their specific gravity is 0.023 greater; they contain a greater percentage of moisture and of starch, and a lesser percentage of protein and ash than flinty kernels.—*D. Reddick.*

33. SCHLEH, [——]. **Einfluss der Aufbewahrung der Kartoffeln auf den Ertrag. [Influence of the storage of potatoes upon the yield.]** Illustr. Landw. Zeitg. 39: 429–430. 1919.—A popular discussion of the proper storage of potatoes in relation to their use as seed. According to the writer, too high temperatures during storage are the chief causes of seed degeneration.—*John W. Roberts.*

34. SIMPSON, S. **Annual Report of the Department of Agriculture, Uganda Protectorate, for the year ending 31st March, 1918.** *69 p.* Uganda Protectorate Dept. Agric. 1918.

35. SPRAGG, FRANK A. **The coefficient of yield.** Jour. Amer. Soc. Agron. 12: 168–174. 1920.—The coefficient of yield is the quotient obtained by dividing the yield of a variety by the calculated yield of the standard or check variety, growing on the same plot the same year. The coefficient of yield method of interpreting results have been used for 6 years and has proven superior to any of the old methods. A compound coefficient of various factors affecting yield, is illustrated showing how it is possible to find superior varieties of field crops. —*F. M. Schertz.*

36. SPRING, F. G., AND J. N. MILSUM. **Notes on the cultivation of ragi (Eleusine coracana).** Bull. Dept. Agric. Federated Malay States 7: 154–161. 1919.—Results are given of the introductory tests of this grain into Malaya, also a consideration of it as a commercial crop.—*T. F. Chipp.*

37. SYLVEN, NILS. **Är det möjligt att inom landet återupptaga en mera omfattande odling av oljeväxter för industriens behov av feta oljor? [Is it possible to again take up a more comprehensive domestic production of oil plants to supply the demands of industry for fatty oils?]** Sver. Utsädesf. Tidskr. 29: 173–205. 1919.—Summary of oil production in Sweden in previous years; effect of the war; factors affecting present demands for oils and present production; market conditions and future prospects.—*E. G. Anderson.*

38. TEDIN, HANS. **Tre års försök med olika havresorter vid Hallands Frökontor i Getinge. [Three years tests of different varieties of oats at the Halland seed office at Getinge.]** Sver. Utsädesf. Tidskr. 29: 224–230. 1919.

39. VOSS, C. **Zur Bekämpfung von Ackersenf und Hederich. [On the control of field-mustard (Sinapis arvensis L.) and hedge-mustard (Raphanus raphanistrum L.).]** Illustr. Landw. Zeitg. 39: 324–325. 1919.—Excellent results were obtained by dusting the weeds with a finely ground mixture of kainit (2.5 Ztr.) and calcium nitrate (17.5 kgm.), especially when applied while the weeds were covered with dew. A solution of ammonium sulphate, applied as a spray, proved superior to a solution of iron sulphate similarly applied. The former proved to be the better weed-killer and was less injurious to cultivated plants.—*John W. Roberts.*

40. WADSACK, A. **Anbau der wichtigsten Oelfruchte. [The culture of the more important oil-producing plants.]** Illustr. Landw. Zeitg. 39: 275–280. 1919.—A short, popular, discussion advocating greater production of oil-producing plants to meet the shortage of animal fats.—*John W. Roberts.*

41. WEIBULL, M. **Om fetthalten i skånska rapsfrön år 1918. [On the oil-content of Skåne rape-seed in 1918.]** K. Landtbr. Akad. Handl. och Tidskr. 58: 236–240. 1919.—Results of determinations of oil content of rape seed grown in 1918 in different parts of Skåne and under varying conditions.—*E. G. Anderson.*

42. WITTE, HERNFRID. **Omfattning of Danmarks nuvarande frödling. [Summary of present seed production in Denmark.]** Sven. Utsädesf. Tidskr. 29: 163–164. 1919.

## BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

LINCOLN W. RIDDLE, *Editor*

43. ANONYMOUS. **Early collections in the garden herbarium.** Missouri Bot. Gard. Bull. 7: 29–35. *Pl. 8–11.* 1919.—A discussion of the BERNHARDI, HAENKE, ROTTLER, and other important collections.—*O. T. Wilson.*

44. ANONYMOUS. **Claude Keith Bancroft.** Kew Bull. Misc. Inf. [London] 1919: 86. 1919. —C. K. BANCROFT, who died in 1919, began his botanical career as a research student in mycology and plant pathology at the Jodrell Laboratory, Kew, England. Later he was Assistant Mycologist in the Malay States. At the time of his death he was Government Botanist of British Guiana.—*L. W. Riddle.*

45. ANONYMOUS. **Sir Edward Fry.** Kew Bull. Misc. Inf. [London] 1919: 84–85. 1919.—The subject of this notice died October 18, 1918. He was a lawyer by profession; but was a lifelong amateur student of the British flora, cryptogamic as well as phanerogamic.—*L. W. Riddle.*

46. ANONYMOUS. **Hector Leveille.** Kew Bull. Misc. Inf. [London] 1919: 85. 1919.—Leveille (1863–1918) was the founder of the Académie Internationale de Géographie Botanique; editor of the *Bulletin de Géographie Botanique*; author of monographic studies of the Onagraceae; and of papers on the flora of China.—*L. W. Riddle.*

47. BARKER, B. T. P., AND G. NEVILLE. **Arthur Eckley Lechmere.** Kew Bull. Misc. Inf. [London] 1919: 164–168. 1919.—This is an account of a promising young English mycologist who died in 1919 at the age of thirty-four. After studying mycology and plant pathology in England, he became a research student, first in the laboratory of PROF. L. MANGIN, in Paris, and then in that of PROF. TUBEUF, in München. There he was working at the time of the outbreak of the war. He failed to leave Germany in time, and was interned for four years. During this period he taught in the prison camps whenever possible, but the hardships which he suffered led to his death within a year of his return to England.—*L. W. Riddle.*

48. BURNHAM, STEWART H. **Charles Horton Peck.** Mycologia 11: 33–39. *Portrait.* 1919.—PECK was born March 30, 1833, in Sand Lake, Rensselaer County, New York. After passing through the State Normal School, he spent four years at Union College, graduating with honors in 1859. "While at Union, he received his botanical instruction from PROF. JONATHAN PEARSON; and in place of athletics, he made botanical excursions." While teaching at Albany, he presented to the State a collection of mosses, which was seen by JUDGE G. W. CLINTON; and it was through Clinton that he was appointed to the State Cabinet of Natural History in 1867. At that time there were about 1800 specimens in the herbarium. "The REV. MOSES A. CURTIS, of North Carolina, first gave Peck a start in the study of fungi . . . ." In 1883 he was appointed to the newly-created office of State Botanist, which he held up to 1915. In 1908 Union College conferred upon him the degree of Doctor of Science. —"DR. PECK was the author of many botanical articles and reports, pre-eminent among which is the long series of annual reports of the State Botanist from 1867 to 1912." He died at Menards, July 11, 1917.—*H. R. Rosen.*

49. [DODGE, B. O.] **Index to American mycological literature.** Mycologia 11: 47–50. 1919.—A list, covering portions of the years 1917 and 1918, of mycological and pathological articles appearing in American publications, is presented.—*H. R. Rosen.*

50. [DODGE, B. O.] **Index to American mycological literature.** Mycologia 11: 227–230. 1919.—Fifty-four articles are listed, some of which appeared in 1918 and others in 1919.—*H. R. Rosen.*

51. [Dodge, B. O.] **Index to American mycological literature.** Mycologia 11: 284–287. 1919.

52. [Dodge, B. O.] **Index to American mycological literature.** Mycologia 11: 323–326. 1919.

53. [Dodge, B. O.] **Index to American mycological literature.** Mycologia 12: 55–58. 1920.

54. Gertz, Otto. **Caroli Linnaei Flora Kofsöensis 1731.** [Swedish.] Bot. Notiser 1919: 85–93. 1919.—The author publishes and discusses a manuscript of Linnaeus, the original of which is found in the library of the Linnean Society in London, and a somewhat varying copy in the University Library at Upsala. On a journey, Linnaeus stopped for half an hour on a little island (180 steps in circumference), in Lake Mälar, Sweden, and made there a record of 81 phanerogams. The names used in this list were mostly those used by Caspar Bauhin and Tournefort. In footnotes are given the names used by Linnaeus for the same plants in the second edition of his Flora Suecica, 1755.—*P. A. Rydberg.*

55. Goff, E. S. **A sketch of the history of horticulture. (Lecture notes prepared in 1889.)** Wisconsin Hortic. 9: 50–51. 1919.—The origin of the art of horticulture among the peoples of the Orient, the Greeks and the Romans is briefly outlined.—*G. F. Potter.*

56. [Grove, W. B.] **George Stephen West, M.A., D.Sc., F.L.S. (1876–1919).** Jour. Botany 57: 283–284. 1919.—West was born at Bradford, April 20, 1876. His father was interested in plants. The son began early to specialize in algae, especially in desmids. He passed through Bradford Technical College, the Royal College of Science, London, and St. John's College, Cambridge. There he was Hutchinson Research student, and demonstrator in biology to the University. Later he was lecturer in natural history at the Royal Agricultural College, Cirencester, and lecturer in botany at the University of Birmingham. At the retirement there of Hillhouse in 1909 he succeeded to his chair, and in 1916 became Mason Professor. He was an excellent teacher and lecturer, greatly enlarged and improved his department, and created a large herbarium. West was the leading British expert on Freshwater Algae, and on the desmids in particular. His principal works are listed, and comment is made on two projected works, one on British Freshwater Algae and the other on the algal flora of the Midlands. His drawings of algae were all bequeathed to the British Museum, but his algological library and specimens went to the University of Birmingham.—*K. M. Wiegand.*

57. Longo, B. **La "Viola di S. Fina" di S. Gimignano. ["St. Fina violet."]** Ann. Botanica [Roma] 14: 179–180. 1917.—Historical discussion of the plant referred to by the above mentioned common name. The author identifies it as *Cheiranthus Cheiri* Linn. A record is also made of the natural growing together by spontaneous grafting of two oaks of different species.—*J. A. Nieuwland.*

58. Naumann, Einar. **Vegetations färgningar i äldre tider. Biologiskt-Historiska Notiser III. En Planctonfärgning i sjön Barken, Dalarne, år 1697. [Vegetable colorations in olden times. Biologic historical notices, III. A Plankton-coloration in Lake Barken, Dalecarlia (Sweden), in 1697.]** (Swedish, with German résumé.) Bot. Notiser 1919: 65–82. 1919.—The author gives the history of the phenomenon as recorded by Urban Hjärne, Jesper Svedberg, and Johan Groot, in 1702–1710. He arrives at the conclusion that it was due to plankton coloration, and suggests as the cause an unusually abundant development of *Botryococcus Braunii*, *Oscillatoria Agardhii* or species of *Glenodinium*, most likely the last-mentioned.—*P. A. Rydberg.*

59. Nordstedt, C. T. O. [Swedish rev. of: Bryk, F. **Linné's Minnesbok (a facsimile reprint of the diary of Linnaeus, 1734–1737).** Stockholm, 1919.] Bot. Notiser 1919: 136. 1919.

60. Reed, Howard S. **Volney Morgan Spalding.** Plant World 22: 14–18. *Portrait.* 1919.—This is a sympathetic appreciation of the life and work of Volney M. Spalding, from 1876 to 1904 connected with the botanical department of the University of Michigan. In the latter year, he resigned because of ill-health. After a year spent in California, he took up his residence at the Desert Laboratory at Tucson, Arizona, where he carried on investigations for the next four years. After 1909, he was obliged to give up active work, on account of declining health, which finally resulted in his death on November 12, 1918.—*L. W. Riddle.*

61. Schweinfurth, G. **Pflanzenbilder im Tempel von Karnak (Theben). [Plant pictures in the Karnak temple (Thebes).]** Bot. Jahrb. 55: 464–480. 1919.—This is an attempt to identify the 275 representations of plants in the 27 photographs taken by H. Schafer in the "botanical room" of the Ammon Temple, Karnak. Most of these are small figures interspersed in vacant places among branches and large plants. Only six or seven plants could be identified with reasonable surety as follows: *Nymphaea coerulea, Punica granatum, Arum italicum, Dracunculis vulgaris, Calenchoe déficiens* (?), *Iris* sp. and *Vitis vinifera.* The artist seems to have delineated many species not native of Egypt, sometimes from memory. The sparing use of trees is astonishing as they were much used by Egyptians in decorative work. They are here mostly in winter condition, and represent such genera as *Morus, Pyrus, Prunus,* and some other genera found in Egypt. Many pictures combine different plants as the centaurs did different animals. Some are diagrammatic and represent no particular plant. *Nymphaea* occurs at least 45 times, and *Punica* 20 times. This is the earliest illustration of *Punica granatum* in Egypt, where it was probably introduced about 1475 B. C. The form illustrated was fastigiate, and is now rare in those countries. *Allium* is represented by a leaf and several fruits in a row. It is probably *A. italicum. Dracunculus* is represented seven times. The *Calenchoe* is most closely related to a species of Abyssinia. The three Iris flowers in the room may represent three different species as they are all different. In most Egyptian bas-reliefs only *I. pallida* was represented, a plant not now found in Egypt. The figure may possibly have been made from *Iris germanica,* the "orris root" which was an old Egyptian plant later introduced into other countries because of its fragrant root-stock.—*K. M. Wiegand.*

62. Smith, Annie Lorrain. **Worthington G. Smith as mycologist.** Trans. British Mycol. Soc. 6: 65–67. 1918.—A short appreciation including mention of his more important mycological papers. His ability as a botanical artist is emphasized and some of his better known sets of illustrations are cited.—*H. M. Fitzpatrick.*

63. Spoehr, H. A. **The development of conceptions of photosynthesis since Ingen-Houss.** Sci. Monthly 9: 32–46. 1919.

64. Viardin, L. **L'organisation forestière, avant 1789, dans la Lorraine reconquise. [Forest organization in reconquered Lorraine prior to 1789.]** Rev. Eaux et Forêts 57: 80–85. 1919.

65. Wakefield, E. M. **Charles Ogilvie Farquarson.** Trans. British Mycol. Soc. 6: 236–237. 1919.—An obituary notice and expression of appreciation of this British mycologist who was lost at sea in October, 1918. For six years preceding his death, he was Mycologist in South Nigeria, West Africa. He published in conjunction with Miss Lister an account of the South Nigerian Mycetozoa, and collected a number of interesting fungi which were later listed in Kew Bull. Misc. Inf.—*H. M. Fitzpatrick.*

66. Woodruff, L. L. **Hooke's Micrographia.** Amer. Nat. 53: 247–264. 1919.—Quotations from Waller's biography of Robert Hooke; summary of objects microscopically surveyed in Micrographia; facsimile reproduction of portions of text referring to "little boxes or cells" in cork.—*J. P. Kelly.*

## BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Alfred Gundersen, *Assistant Editor*

67. Bergey, D. H. **The teaching of elementary systematic bacteriology.** [Author's abst. of paper read before Soc. Amer. Bact.] Absts. Bact. 4: 1. 1920.—The student is given a list of simple and expressive terms to be used in the description of cultures. All the observations and descriptions of cultures are entered in unruled note books about 8 by 10 inches. Simple methods of staining are practiced on different morphologic types of non-pathogenic bacteria. Drawings are made of each organism studied. The student is taught how to transplant cultures from one medium to another and to isolate bacteria in pure culture from mixed cultures by the plate method. The pure cultures are planted on all the usual laboratory media for a systematic study. The observations and descriptions in the systematic study are entered in the student's note book in a definite order. The descriptions are made according to the terminology given. The character and the progressive development in the cultures are illustrated by drawings.

68. Campbell, Douglas Houghton. **The springtime garden in California.** Nat. Study Rev. 16: 181–188. 1920.—Describes California garden conditions, with mention of manzanita, almond, toyon, eucalyptus, daphne, narcissus, iris and other plants.—*A. Gundersen.*

69. Kirkhuff, Pauline. **The flower land—California.** Nat. Study Rev. 16: 228–230. 1920.

70. Palmer, Clayton F. **Agriculture in the elementary schools of Los Angeles City.** Nat. Study Rev. 16: 217–220. 1920.

71. Riley, Dolores. **California's tree islands.** Nat. Study Rev. 16: 223–224. 1920.—Monterey pine, Monterey cypress, Torrey pine.

72. Rogers, Julia Ellen. **At Palm Springs with the Sierra Club.** Nat. Study Rev. 16: 195–197. 1920.

## FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*
J. V. Hofmann, *Assistant Editor*

73. Adamson, R. W. **The Bartram oak.** Sci. Amer. 122: 301. 1920.

74. Afzal, Muhammed, and others. **Progress report of forest administration in Baluchistan for 1918–19.** *24 p.* Calcutta, 1920.—An area of 313 square miles of reserved forests is reported and 472 square miles of unclassed forests with no changes in the last 5 years. The chief object of forest policy aimed at in this Province is to preserve the few existing forests and thereby prevent denudation. The forests are administered for the public benefit. The reservation of the forests does not aim at any profit to the Government but at checking destruction by regulating the rights and restricting the privileges of users. The financial statement shows these averages, for the last 5 years: Revenue, 20,539 Rs, Expenditure 28,130 Rs, giving a deficit of 7591 Rs. During the past year the deficit sank to 2403 Rs against a 13,607 Rs deficit the previous year. The area open to grazing was 45.3 per cent of the total area of the State forests. In experimental planting deodar and blue pine failed to germinate but chil was satisfactory. There was heavy winter loss of chil seedlings but those surviving give good promise. Natural reproduction of the hill species is scarce in all forests as there was a bad seed year. Babool and Jhand seedlings started in the Sibi forests but were killed by failure of the summer monsoon. Coppice reproduction of tamarisk and willow has, as usual,

been successful in all localities. Out of a number of exotics, Turkey oak, American maple and alder are growing well, catalpa and osier have given the best results and can safely be regarded as successful, saffron plants have completely disappeared and *Eucalyptus rudis* has not proven a success. European olive plants and cuttings have given fair success. The usual formal tabulated statements are appended.—*E. R. Hodson.*

75. Anonymous. **Future organization of the forest department of India.** Indian Forester 45: 234–239. 1919.

76. Anonymous. **List of seeds of hardy herbaceous plants and of trees and shrubs.** Kew Bull. Misc. Inf. [London] 1919: Appendix 1–23. 1919.—See Bot. Absts. 4, Entry 844.

77. Anonymous. **Nogel Undersøgelser og Forsøg Med Musegift.** [Some investigations on poison for mice.] Dansk Skovforenings Tidsskr. 4: 396–401. 1919.

78. Anonymous. **Sugar and alcohol from the nipa palm.** Sci. Amer. Monthly 1: 310. 1920.—Extract of an article in Bull. Manila Bur. Sci.

79. Bailey, I. W. **Depressed segments of oak stems.** Bot. Gaz. 67: 438–441. *4 fig.* 1919.—See Bot. Absts. 4, Entry 994.

80. Bardie, A. **Excursion mycologique de la Société Linnéenne à Léognan le 12 Novembre, 1916, nos bieilles forêts; nécessité de leur conservation.** [Mycological excursion of the Linnean Society to Léognan, Nov. 12, 1916.] Actes Soc. Linn. Bordeaux (Proces-verbaux) 69: 105–113. 1915–16.—The author emphasizes the value of the forests as a national asset. A list of the fungi collected is included.—*W. H. Emig.*

81. Baxter, Samuel Newman. **How nurserymen may best compete for the Christmas tree market.** Florists' Exchange 49: 133. 1920.—See Bot. Absts. 5, Entry 518.

82. Beck v. Mannagetta, and G. Lerchenau. **Wacholderbeeren mit entblöszten Samen.** [Juniper berries with exposed seeds.] Sitsungsber. K. Akad. Wiss. Wien (Matht. Nat. Kl.) 126: 403–419. *Fig. 1–31.* 1917.—See Bot. Absts. 4, Entry 983.

83. Beekman, H. **78 Preanger-houtsoorten, beschrijving, afbeelding en determinatie-tabel.** [78 Preanger timber species described, illustrated, and determination table.] Mededeel. Boschproefsta. Dept. Landb., Nijverheid en Handel Nederlandsch-Indie 5: 1–186. *60 pl.* (*photomicrographs*). 1920.—In the lumber market of western Java, especially the Preanger residencies, teak is scarce and does not occupy a predominant place. On this account many other kinds of woods which occur in the mountain forests are used. The market distinguishes only three quality classes. Owing to the lack of knowledge concerning the characteristics of these woods this practical guide for their determination is published. Following a popular description of the elements of wood structure, each of the 78 kinds is described under the headings, general impression, appearance, detailed characteristics by use of hand lens, nature of extract, and burning. Of the 28 families represented the following contain the most important species: Dipterocarpaceae, Fagaceae, Hamamelidaceae, Lauraceae, Leguminosae, Magnoliaceae, Malvaceae, Meliaceae, Myrtaceae, Rubiaceae, Taxaceae, Theaceae, Verbenaceae.—*F. Kramer.*

84. Beeson, C. F. C. **Food plants of Indian forest insects.** Indian Forester 45: 312–323. 1919.—Continuing work previously noted, 83 species belonging to three families are listed with the plants upon which they feed.—*E. N. Munns.*

85. Berry, E. W. **The history of the linden and ash.** Plant World 21: 163–175. *3 fig.* July, 1918. 1919.—See Bot. Absts. 4, Entry 1202.

86. Beumée, J. G. B. **Over Bastverwondingen aan den djati. [Bark wounds of teak.]** Mededeel. Proefsta. Boschw. Dept. Landb. Nijverheid en Handel Nederlandsch-Indië 4: 31–54. *Pl. 12–17.* 1919.—See Bot. Absts. 6, Entry 218.

87. Bixby, W. G. **The butternut and the Japan walnut.** Amer. Nut Jour. 10: 76–79, 82, 83, *11 fig.* 1919.—See Bot. Absts. 5, Entry 329.

88. Cooper, G. M. **Growth of sal from broadcast sowings.** Indian Forester 45: 310–312. 1919.—An average girth of 5.17 inches and an average height of 12 feet 2 inches was made by a sal plantation from broadcast seed in 5 years from sowing.—*E. N. Munns.*

89. Dixon, H. H., and W. R. G. Atkins. **Osmotic pressures in plants. VI. On the composition of the sap in the conducting tracts of trees at different levels and at different seasons of the year.** Sci. Proc. Roy. Dublin Soc. 15: 51–62. 1918.—See Bot. Absts. 5, Entry 848.

90. Eaton, B. J. **Commercial possibilities of Para rubber seed oil.** Agric. Bull. Federated Malay States 7: 73–78. 1919.—Gives the results, yield, and sale price, of an experimental shipment of 25¾ tons of seeds to England.—*E. D. Merrill.*

91. Ferreri, E. **Dati dendrometrici sul faggio della foresta inalienabile di Camaldoli. [Dendrometric data on Fagus in the inalienable forest of Camaldoli.]** Staz. Sper. Agr. Ital. 52: 542–543. 1919.—*A. Bonazzi.*

92. Ferreri, E. **Applicazione di dieci metodi di cubatura per la determinazione della massa legnosa di 42 piante di abete bianco in piedi della foresta inalienabile di Camaldoli. [The applicability of ten methods for determining the total quantity of lumber in 42 standing plants of white pine in the forest of Camaldoli.]** Staz. Sper. Agr. Ital. 52: 587–598. 1919.—A comparative study of the different methods.—*A. Bonazzi.*

93. Glover, H. M. **Spruce red wood.** Indian Forester 45: 243–245. 1919.—A red "heartwood" is often formed in the Himalayan spruce, which is moister than sapwood and cannot be floated. This dries out readily but after being placed in water regains its original specific gravity.—*E. N. Munns.*

94. Harper, Roland M. **The supposed southern limit of the eastern hemlock.** Torreya 19: 198–199. Oct., 1919.—See Bot. Absts. 4, Entry 337.

95. Hartley, Carl, T. C. Merrill, and Arthur S. Rhodes. **Seedling diseases of conifers.** Jour. Agric. Res. 15: 521–558. *Pl. B.* 1918.—See Bot. Absts. 4, Entry 1296.

96. Hawes, A. F. **Cooperative marketing of woodland products.** U. S. Dept. Agric. Farmers' Bull. 1100. *15 p., 6 fig.* 1920.

97. Heimlich, Louis F. **The trees of White County, Indiana.** Proc. Indiana Acad. Sci. 1917: 387–471. *34 pl.* 1918.—See Bot. Absts. 4, Entry 338.

98. Henkel, J. S. **Why grow trees?** Rhodesia Agric. Jour. 17: 137–141. 1920.

99. Hollick, A. **The story of the Bartram oak.** Sci. Amer. 121: 422, 429–430, 432. *6 fig.* 1919.—See Bot. Absts. 4, Entry 615.

100. Kotze, J. J., and E. P. Phillips. **A note on the genus Faurea Harv.** South African Jour. Sci. 16: 232–238. *Pl. 13–18, 2 fig.* 1919.—*Faurea natalensis* is evidently confined to the eastern coastal forest belts. *Faurea Mcnaughtonii* is only known from Knysna, where it is confined to the Lily Vlei Forest. *Faurea saligna* is used for fence posts, as a wagon wood and for furniture, etc. It is said to be fairly ant resistant. *Faurea Mcnaughtonii* is remarkable for the durability of its timber, which compares favorably with that of the sneezewood.—*E. P. Phillips.*

101. Marshall, Roy E., and F. D. Fromme. **Red cedar trees and cedar rust: a report of a cedar rust survey of Augusta county, Virginia.** Virginia Polytechnic Inst. Ext. Bull. 39. *8 p. 1 fig.* 1920.—See Bot. Absts. 4, Entry 1317.

102. Mörk-Hansen, K. **C. H. Schröders udhugning i bög.** [**C. H. Schröder's thinning system in beech forest.**] Forst. Forsögsväsen Danmark 5: 156–178. *Pl. 1–2.* 1920.—The tables and discussion cover growth and recovery in three-storied beech forest in Denmark after the Schröder method of thinning, which aims at producing straight, clear-boles trunks from previously suppressed trees. The principle guiding the cutting may be summed up in saying "Cut what is harmful and useless." The forester must know, however, how the trees are going to respond, what space they need for best development, etc. After thinning, the trees in the second story will help prune the upper, and those in the third story will help prune those in the second story.—*J. A. Larsen.*

103. Opperman, A. **Sommerfälding i Bögeskov.** [**Summer-cutting in beech forest.**] Forst. Forsögsväsen Danmark 5: 180–192. 1920.—Beech cut in summer to be used for fuel during the following winter showed insufficient drying.—*J. A. Larsen.*

104. Robson, W. **Bay trees (Pimenta acris).** Rep. Agric. Dept. Montserrat 1917–18: 17. Imp. Dept. Agric. Barbados, 1919.—See Bot. Absts. 5, Entry 820.

105. Rose, R. C. **After-ripening and germination of seeds of Tilia, Sambucus and Rubus.** Bot. Gaz. 67: 281–309. 1919.—See Bot. Absts. 4, Entry 1574.

106. Rumbold, Caroline. **The injection of chemicals into chestnut trees.** Amer. Jour. Bot. 7: 1–20. *7 fig.* 1920.—See Bot. Absts. 5, Entry 964.

107. Sabroe, Axel S. **Skovträer i det nordlige Japan.** [**Forest trees of northern Japan.**] Forst. Forsögsväsen Danmark 5: 105–155. *Pl. 2–28, 1 fig.* 1920.—A report setting forth what Japanese forest trees may be suitable for culture in Denmark. The forests of Japan have been classified altitudinally into four zones: torrid, sub-tropical, temperate and frigid. Since the climate in the temperate zone is more nearly like that of Denmark, only the trees in this zone are considered. Much space is given to comparative data on temperature and precipitation for different stations, and there are many excellent views and valuable information concerning the trees; however, since the climate of Denmark is essentially continental and that of Japan insular, little hope is expressed for the success of experimental introduction. *Cryptomeria japonica* appears only where there is protection to the roots by deep snow; *Pinus thunbergii*, which grows along the coast, may prove a better species in Denmark than *Pinus montana*; *Abies sachaliensis*, *Quercus dentata* and *Larix kurilensis* should be tried on the Danish downs. *Larix leptolepis* is more immune from *Sasyscypha willkommii* than *L. europaea*. The Japanese beech is not more promising than the European. Several smaller broadleaves, among which are *Acanthopanax ricinifolius*, *Cercidiphyllum japonicum*, *Quercus grosserata*, *Fraxinus manshurica* and *Betula maximowiczii*, are recommended for trial.—*J. A. Larsen.*

108. Sargent, C. S. **Notes on North American trees. V.** Jour. Arnold Arboretum. 1: 61–65. July, 1919.—See Bot. Absts. 4, Entry 1766.

109. Sim, T. R. **Soil erosion and conservation.** South African Jour. Indust. 2: 1034–1042. 1919.—See Bot. Absts. 4, Entry 1635.

110. Smythies, E. A. **Geology and forest distribution.** Indian Forester 45: 239–243. 1919.—There is a relation between geology and forest types which apparently so far has been neglected in type studies. A plea is made for a closer study of geological formations in connection with such work.—*E. N. Munns.*

111. Troup, R. S. **Experiments in the pollarding of Butea frondosa for lac cultivation.** Indian Forester 45: 223–233. *Pl. 14, 15.* 1919.—Pollarding of *Butea frondosa* is possible without seriously affecting the vitality of the trees, and the best results are obtained by pol-

larding on an annual rotation, half being cut for the summer crop, and half for winter. Isolated trees produce more lac than those in dense stands, and thinning is necessary in congested stands. Predacious insects should be killed by prompt treatment after harvest by burning litter and by fumigation.—*E. N. Munns.*

112. Weir, James R., and Ernest E. Hubert. **A study of the rots of western white pine.** U. S. Dept. Agric. Bull. 799. *24 p.* 1919.—See Bot. Absts. 4, Entry 1379.

# HORTICULTURE

J. H. Gourley, *Editor*

## FRUITS AND GENERAL HORTICULTURE

113. Anonymous. **The dwarf cocoanut in Malaya.** Tropical Life 16: 54–55. 1920.—Review of an article by W. P. Handover in a recent issue of Agric. Bull. Federated Malay States, describing the dwarf coconut known in Malaya as Nyor Gading or ivory coconut. The dwarf variety is hardy, begins bearing in its fourth year, often at a height of only 10 feet, and bears nuts of especially good quality.—*H. N. Vinall.*

114. Conners, C. H. **Some notes on the inheritance of unit characters in the peach.** Proc. Amer. Soc. Hortic. Sci. 16: 24–36. (1919) 1920.—This paper presents the data secured from the first crop picked from the first generation seedlings from crosses among commercial varieties of peaches. The parents used in one series of crosses were Elberta, Belle, Greensboro and Early Crawford. Although most of the seedlings bloomed at the normal period of bloom for the varieties used, still several of them bloomed from 4 to 8 days later. This would be desirable from the standpoint of irritability or tendency to start into growth during the warm spells in the winter. Blossoms of the peach may be arranged into three groups as regards size: large, medium, small.—Early Crawford, a small-blossom variety, when self-pollinated gave seedlings, the blossoms of which were nearly all small.—When small-blossom varieties were crossed with large-blossom varieties, the seedlings had medium sized blossoms.—The results seemed to indicate that the medium-size blossom was an intermediate, for when crossed among themselves or selfed the seedlings split into approximately the Mendelian rate for hybrids; large blossoms being dominant. Indications seem to point to two pure types of bloom, the large and the small, with the medium-sized blossom as an intermediate.—In addition to the correlation between the color of the inside of the calyx cup and the flesh of the fruit as described by Hedrick, a correlation between the color of the leaves, midrib and veins and the color of the fruit is given.—Ripening dates of the crosses did not vary much from those of the parents, although there were certain exceptions. It would seem that a cross between a pure white and a pure yellow would give all white flesh in the $F_1$.—Wherever a white-fleshed variety is crossed upon a yellow-fleshed variety, the seedlings show a marked increase in vigor over that of the yellow parents. This is especially true where Greensboro is used.—Freestone × freestone gave about two-thirds freestone seedlings and one-third semi-cling or cling. Freestone×clingstone gave a large proportion of clingstone seedlings, varying with the degree of clinginess of the parents and with the power of the freestone parent to product freestone seedlings.—From an economic aspect a number of the seedlings are outstanding and have been propagated for further trial. Among these are: (1) Several seedlings of Belle × Greensboro, freestones, oval in shape, of very bright color, resistant to brown rot, vigorous and productive, ripening at the season of Carman.—(2) A seedling of Belle × Early Crawford, ripening at the time of Champion, round in shape, freestone, a vigorous grower, having the flavor of Champion, but resistant to brown rot.—(3) Several seedlings of Belle × Early Crawford that resemble Belle in shape but have the color of Early Crawford, of good quality and ripening about the season of Belle.—(4) A seedling of Early Crawford × Elberta, resembling Elberta in shape and color but of superior quality, ripening about one week before Elberta.—The author lists the following general results: Elberta carries white flesh as a recessive character to the extent of about one-third. It seems

prepotent with respect to ripening period. Its character for quality is only mediocre.—Belle is strongly white, but seems to carry a 25-per cent character for yellow. It is prepotent with respect to vigor and quality and carries a character factor for clinginess of about 25 per cent. —Early Crawford is almost pure yellow. Its character for quality seems dominant as does its character for freestone.—Greensboro seems to be pure white, is clingstone, but carries small factor for freestone.—White on yellow gives increased vigor.—White seems to be dominant over pure yellow in the $F^1$ generation.—*E. C. Auchter.*

115. Crow, J. W. **Breeding methods with horticultural plants.** Proc. Amer. Soc. Hortic. Sci. 16: 19–24. (1919) 1920.—A plant-breeders' classification of plants is given. Attention is called to the fact that it is important to know whether a given plant produces seed by cross-pollination or self-pollination, and whether the reverse process is possible. The main principles of biological evolution as given are isolation of strains of heredity and recombination of characters by crossing. A discussion of each of these principles, with individual cases and examples, is given. A distinction between the words "selection" and "isolation" is discussed. Isolation consists in the segregation of a type or a line of heredity, which was there all the time and which is only brought to light through being segregated. "Selection," as used by Darwin, implies a gradual change of a cumulative nature in each successive generation. Although it is stated that in some cases it is impossible to say where isolation ceases and selection begins, still the author states, "It appears that isolation expresses the fundamental idea of most improvement work much better than does the word selection.—*E. C. Auchter.*

116. Dorsey, M. J. **Some characteristics of open-pollinated seedlings of the Malinda apple.** Proc. Amer. Soc. Hortic. Sci. 16: 36–42. (1919) 1920.—In the fall of 1907 a quantity of Malinda apples was obtained from an orchard in which were growing several other common varieties. The apples were open-pollinated. Seeds from these apples were removed and planted, and a total of 3879 seedlings were grown.—Up to the present report 49.1 per cent of this number (1903) had been removed as wild types or as stunted, and 20.8 per cent (808) had been discarded because of inferior fruit, while 30.1 per cent had been saved for further study.—Many of the seedlings came into fruit during the sixth year, although there was a variation in the time of first fruit production. About 300 seedlings have been selected on account of their promising fruit and now present a difficult task in the final weeding out. No two seedlings have borne fruit exactly alike, some are sweet, some are sour, some are large, some are small, some are quite hardy, while others are tender, and there is great variation in the markings of the different fruits.—In observing how hardy the 1168 seedlings were during the winter of 1917–1918, the following three things were outstanding: (1) 195 trees escaped all injury, (2) there was a greater injury generally to the trunk than to the main branches, (3) the extent of the injury to the trees in each row was fairly consistent. In comparing these results to Hibernal and Oldenburg, two of the hardy winter varieties in Minnesota, it was found that these varieties were generally hardy in the top, but the wood was often slightly brown in the trunk. *Pyrus baccata* was not injured, but such varieties as Grimes Golden, Delicious, Hubbardston, Winter Banana, etc., were all brown or dark brown in the wood, even in the smaller limbs.—*E. C. Auchter.*

117. Eaton, B. J. **Investigations in agricultural chemistry, 1918.** Agric. Bull. Federated Malay States 7: 224–227. 1919.—Results on the chemical examination of rubber samples, soils, and other special investigations in Malaya are given.

118. Galloway, B. T. **Tests of new pear stocks.** Nation. Nurseryman 28[6]: 109–111. May, 1920.—Discusses the value of the following pear stocks for American use: *Pyrus Calleryana*, *P. usuriensis*, *P. serrulatas*, and *P. betualaefolia.*—*J. H. Gourley.*

119. Handover, W. P. **The dwarf coconut.** Agric. Bull. Federated Malay States 7: 295–297. 1919.—See also Bot. Absts. 6, Entry 113.

120. Hendrickson, A. H. **Inter-species pollination of plums.** Proc. Amer. Soc. Hortic. Sci. 16: 50–52. (1919) 1920.—Studies were made regarding the self fertility of the following varieties: Burbank (*P. triflora*), Reine Claude (*P. domestica*), German Prune (*P. domestica*), and Shropshire (*P. insititia*). The varieties were likewise inter-crossed with the following results as given in the author's summary.—(1) Burbank and German gave evidence of being self-sterile.—(2) Reine Claude and Shropshire gave evidence of being self-fertile.—(3) Burbank and Reine Claude are apparently inter-fertile.—(4) Reine Claude, German Prune and Shropshire are inter-fertile.—(5) From these data it is evident that, as far as the varieties tested are concerned there is no sterility existing between *P. triflora* and *P. domestica* or between *P. domestica* and *P. insititia*.—*E. C. Auchter.*

121. Jack, H. W. **Preliminary report on experiments with wet rice in Krian.** Agric. Bull. Federated Malay States 7: 298–319. *4 fig.* 1919.—Krian is the largest padi-growing district in Federated Malay States, about 50,000 acres being planted annually with wet rice. The experiments were made with a view to the improvement of yield of grain. Nearly 200 varieties were found but only six are used for the main crop. Introduced varieties, 8 Siamese, 9 Javanese, 14 Indian, were tried but did not equal the local strains. The cultivation of padi, hybridization, diseases, and pests, are treated at some length.—*T. F. Chipp.*

122. Kruckeberg, Henry W. **California Bud Selection Association standardizing nursery products.** Amer. Nurseryman 31: 100–101. May, 1920.—A general discussion is given of the individuality of fruit trees and the value of propagating from recorded trees. This movement is receiving considerable attention in California, by the prune growers and in the citrus-fruit regions.—*J. H. Gourley.*

123. Lamproy, E. **Les engrais radioactifs. [Radioactive fertilizers.]** Rev. Hortic. [Paris] 91: 393–394. Dec., 1919.—Experiments with this type of fertilizer were conducted on beans, wheat, spring vetch, white pea, flax, potato, beet, Jerusalem artichoke and sun-flower. The effects of the radioactive substances upon the cereals were more pronounced when they were combined with superphosphates, and the larger returns were generally obtained when they were used in connection with complete fertilizers. Approximately 50–60 kilos were applied to each hectare. The influence of the radioactive materials was especially noticeable upon plants producing tubers or thick roots, particularly regarding sugar content. These fertilizers are worthy of trial for use with specific horticultural crops.—*E. J. Kraus.*

124. Lewis, C. I., F. C. Reimer, and G. G. Brown. **Fertilizers for Oregon orchards.** Oregon Agric. Exp. Sta. Bull. 166. *48 p. Fig. 1–3.* 1920.—Fertilizer experiments on apple pear, and peach trees in southern Oregon indicated that the chief element needed is nitrogen, which, if immediate results are sought, may be applied in the form of nitrate of soda, nitrate of lime, or sulfate of ammonia at the rate of 6–10 pounds to each old apple or pear tree, and 3 pounds to each large peach tree. On some of the very heavy soils, which show a fair amount of nitrogen, it is not profitable to use mineral fertilizers at present. In the Hood River Valley it was shown, through a period of 5 years experimentation, that Newtown and Spitzenberg apple trees with low vigor due to depleted nitrogen supply failed to set fruit well and that there was a marked tendency toward alternate bearing. When available nitrogen was increased, however, through the use of either leguminous shade-crops, commercial fertilizers, or both in combination and generally supplemented by irrigation, the fruit set was increased, and in some cases the tendency toward alternate bearing was retarded. Because all orchard practices were not within control each year, conclusive evidence on the latter point was not obtainable. In the case of Spitzenberg apples, increased sizes and yields of fruit were offset at times by decreased quality and color, when very large amounts of nitrate of soda or sulfate of ammonia were used, especially in conjunction with leguminous shade-crops and irrigation. Applications of nitrate of soda to separate plots at intervals of two weeks, from March 6 to May 7, showed that "the early-fertilized Newtowns yielded 7.9, and the Spitzenbergs 10.83 loose boxes per tree, as compared to only 2.28 and 1.20 boxes for the latest application. With orchards on heavier soils, particularly, a system of management in which clover only is used

may be expected to keep up soil fertility without the use of nitrate fertilizers. There is need for correlating all orchard practices, such as tillage, irrigation, pruning and cover-cropping.—*E. J. Kraus.*

125. Lind, Gustaf. **Om förekomsten av vara viktigare skogsbär.** [On the occurrence and distribution of our more important bush fruits.] K. Landtbr. Akad. Handl. och Tidskr. 58: 175–177. 1919.

126. Lindley, Paul C. **Report of the Southern Nurserymen's Association.** Jour. Econ. Entomol. 13: 194–198. 1920.—A report presented to the Section of Horticultural Inspection at the thirty-second annual meeting of the Amer. Assoc. Econ. Entomol., January, 1920.—*A. B. Massey.*

127. Macoun, W. T., and M. B. Davis. **Progress in apple breeding for the Canadian prairies.** Proc. Amer. Soc. Hortic. Sci. 16: 13–18. (1919) 1920.—In 1887 seed of *Pyrus baccata* was obtained from the Imperial Botanic Gardens, Petrograd, Russia, and sown in Ottawa, Canada. In 1890 young trees from these seeds were sent to different Canadian experimental farms. These trees proved hardy, and, in 1894, 21 varieties of apples used as male parents were crossed on to these crab trees. The resulting fruit in the $F_1$ generation, while not much larger than that of the female parent, was of better quality. At the lower elevations, most of the crosses were quite hardy. Two of the crosses, named Columbia and Osman, were quite hardy in exposed and trying places.—In 1904 the best of the $F_1$ crosses were crossed with 18 different varieties of apples. This second infusion of apple "blood" increased the resulting size greatly, but still the fruit was not above the smallest marketable size for apples. Individual records and dimensions of fruit are given. When Pioneer, a seedling from the cross *P. baccata* × Tefofsky, was crossed with McIntosh, Northern Spy, Cranberry Pippin and Ontario, the male parents, especially McIntosh, exerted a marked influence on quality.—Breeding work will be continued, using *P. baccata* as the male parent and the Russian varieties as female parents, in the hope of getting hardier varieties that will withstand the severest tests on the Canadian prairies.—*E. C. Auchter.*

128. Marlatt, C. L. **Federal plant quarantine work and co-operation with state officials** Jour. Econ. Entomol. 13: 179–181. 1920.—Report presented to the Section of Horticultural Inspection at the thirty-second annual meeting of the Amer. Assoc. Econ. Entomol., January, 1920.—*A. B. Massey.*

129. Marshall, Roy E. **Report of three years' results in plum pollination in Oregon.** Proc. Amer. Soc. Hortic. Sci. 16: 42–49. (1919) 1920.—Several varieties of plums of different species were tested as to whether they were self-fruitful, self-fertile, self-sterile, or self-barren. Varieties of *Prunus domestica* were tested to see if these were inter-fruitful. Studies were also made to see whether varieties of *P. domestica* and *P. triflora* were inter-fruitful. The author's summary is as follows: (1) Pollen of the varieties of *Prunus domestica* and *P. triflora* seem to germinate best in a solution of 5 per cent cane sugar and 2 per cent gelatin.—(2) If there is a normal bloom and 1 flower in 20 matures into a fruit, the result may be a full crop in some cases, while in some others 1 in every 2 or 3 flowers should set to mature a full crop. Generally, 1 flower in 5 should set.—(3) Thirteen of the 23 varieties tested are evidently self-barren. Blue Damson is decidedly self-fruitful. Italian and Petite are partially self-fruitful. The other varieties should be considered virtually (commercially) self-barren.—(4) The varieties of *P. domestica* may be considered as inter-fruitful.—(5) Italian and Petite are each good pollenizers for practically all varieties of *P. domestica* tested.—(6) It is not necessary that one be particular as to which of the varieties of *P. domestica* commonly grown in the Pacific Northwest are planted together, provided they bloom at approximately the same time. Some varieties are commercially profitable where no pollenizers are used.—(7) In such varieties as Italian, Petite, Sugar and Golden Drop, the pericarp ceases development soon after the seed dies and the fruit soon falls.—(8) In such varieties as Bavay, Blue Damson, Giant, Green Gage, Pond, Quackenbos, Red Magnum Bonum, Tennant

and Tragedy, the fruit may mature regardless of complete seed development.—(9) For the varieties tested, there is no direct relation between the variety of pollen used and the ratio which exists between plump or well developed seeds and matured fruits. The ratio is fairly constant for the variety, regardless of the kind of pollen applied.—(10) There is evidently no relation existing between the degree of fruitfulness of reciprocal crosses.—(11) The results obtained indicate that the results are the same whether the varieties of a given species are closely related or non-related.—(12) The species of *P. domestica* and *P. triflora* may be considered inter-sterile for all practical purposes.—*E. C. Auchter.*

130. MATHIEU, E. **The oil palm in the East.** Gardens' Bull. Straits Settlements 2: 217–230. *2 fig.* 1920.—A discussion on the cultivation of *Elaeis guineensis* in the East.—*T. F. Chipp.*

131. MILSUM, J. N. **Fruit culture in Malaya.** Dept. Agric. Federated Malay States Bull. 29. *108 p., 33 pl.* 1919.—Describes what fruits can be grown and their treatment.—*T. F. Chipp.*

132. NEWELL, WILMON, AND FRANK STIRLING. **Statistics on citrus plantings in Florida.** Florida State Plant Bd. Quart. Bull. 3: 113–116. 1919.—The data were accumulated in connection with the work of eradicating citrus canker and represent complete and up-to-date information on the subject. The data show that the total acreage devoted to the citrus groves in the state is 160,397, of which 115,324 acres are of bearing age and 45,073 are non-bearing. A comparison is made with the acreage in California which shows that the latter state has only a little over 12,000 acres more of orange and grapefruit groves; to this should be added 48,000 acres of lemon plantings in California while the acreage devoted to lemons in Florida is negligible.—*C. D. Sherbakoff.*

133. PIROTTA, R. **Osservazioni sul fiore dell'olivo.** [**Olive flowers.**] Atti R. Accad. Lincei [Roma] Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[2]: 1–9. 1919.—Examinations were made of flowers of the common olive (*Olea europaea* L.), which showed that the flowers might be divided into three classes: monoclinous, clearly staminiferous, and physiologically staminiferous. They may be on the same or different individuals. In this respect the olive behaves like the wild, closely related *Phillyrea.* The aspect of the trees with these different types of flowers is described.—*F. M. Blodgett.*

134. SASSCER, E. R. **Important foreign pests collected on imported nursery stock in 1919.** Jour. Econ. Entomol. 13: 181–184. 1920.—Paper presented to the Section of Horticultural Inspection at the thirty-second annual meeting of the Amer. Assoc. Econ. Entomol., January, 1920.—*A. B. Massey.*

135. SPRING, F. G., AND J. N. MILSUM. **Food production in Malaya.** Dept. Agric. Federated Malay States Bull. 30. *112 p., 12 pl.* 1919.—The principles of cultivation of the different food crops of Malaya are considered from the point of view of increasing the food supply of the country.—*T. F. Chipp.*

136. STARK, MAJOR LLOYD C. **French orchards and nurseries after the war.** Nation. Nurseryman 28[1]: 6–8. Jan., 1920.—There are no large commercial orchards in France comparable to those in America, but a large amount of fruit is produced from the smaller orchards and fruit gardens. Grapes, on the other hand, are grown on a gigantic scale, being supported by the wine industry.—Apples and pears are usually dwarfs and they are pruned in cordons, espaliers, and in every conceivable design and fashion. In Normandy the best orchards are grown, and the land is best adapted to the apple.—Most orchards are grown in sod and the trees are pruned to a flat, umbrella-shaped head in most instances. No variety of apple seems to be generally grown in France, but each locality has its own favorite.—The pear industry is much more important there than in America and the blight gives little or no trouble. The Bartlett, grown under the name of "English William" is the most popular

variety.—The sections which produced the stocks on which American fruits were worked have been practically destroyed and it has resulted in a tremendous increase in cost of stocks in U. S. A., as great as from $5 or $6 to $50 and $60 per thousand for apple seedlings. The bearing orchards are also destroyed in many sections which were occupied by the enemy.—*J. H. Gourley.*

137. WHITTEN, J. C. **An investigation in transplanting.** Missouri Agric. Exp. Sta. Res. Bull. 33. *73 p.* [1919.] 1920.—Investigations covering a period of 10 years show that under Missouri conditions fall transplanting is to be preferred to spring transplanting in the case of many deciduous fruit trees and shrubs. This is due mainly to the fact that the fall transplanted trees generally form some new roots during the winter and consequently are in a position to begin growth in early spring; while spring transplanted trees must wait until the soil warms up sufficiently for root growth before they can become established. If the top starts to vegetate much before roots are formed the new shoots dry out and die. It is for this reason that there is frequently a comparatively heavy mortality on the part of spring-set trees. Late spring transplanting gives as good results as early spring transplanting, if the trees are dormant at the time of setting. Similarly, late fall transplanting gives results as good or better than those attending early fall transplanting. The formation of new roots by transplanted trees is dependent to a great extent upon proper soil temperature. In the case of the fall set trees new roots are formed first from the lowest roots of the transplanted tree because temperature is apt to be more favorable at those depths; in the case of spring-transplanted trees root formation first takes place nearer the surface. This suggests one danger from too deep setting in the spring. Some root formation takes place below the frost line throughout the winter. Trees that are "heeled in" during the winter may be held dormant for late transplanting by lifting from the ground and "heeling in" again, whenever their buds show signs of starting. The roots of deciduous fruit trees and shrubs are very tender to frost while they are out of the ground and great care should be exercised to prevent their freezing. The small, fibrous roots of ordinary deciduous fruit trees usually die when they are transplanted and it is better to prune them away than to attempt to save them.—*V. R. Gardner.*

138. WIGGANS, C. C. **Some factors favoring or opposing fruitfulness in apples.** Missouri Agric. Exp. Sta. Res. Bull. 32. *60 p.* [1918.] 1920.—A study was made of the performance of individual spurs of a number of apple varieties to determine, if possible, the factors associated with productiveness and unproductiveness. The conclusion is reached that individual spur performance is not dependent mainly upon such external factors as soil or seasonal variation in moisture, but rather to conditions within the tree or even the spur itself. Some apple varieties form a group in which the individual spurs are capable of fruiting every year; other varieties form a group in which the individual spurs seem to lack this ability. The habit of alternate bearing possessed by certain varieties seems closely associated with this performance characteristic of the individual spur. The sap concentration of bearing spurs averaged somewhat higher than that of non-bearing spurs. Non-bearing spurs have more, but not larger, leaves than bearing spurs. Girdling increased sap density above, and decreased it below, the point of girdling, the greatest influence being found comparatively close to the point of injury. In pot cultures with soil and sand and using several varieties, nitrogen influenced wood growth and fruit bud formation, while no influence of either potash or phosphorus could be detected. Differences in the sap concentration of leaf and twig sap of trees growing under different tillage methods were comparatively small. Training trees to an extremely high head removes an unnecessary amount of vegetative growth, reduces the number of fruit spurs during the early life of the tree, and consequently delays the time when the tree comes into bearing.—*V. R. Gardner.*

139. WOLFF, W. H. **Influence of the prevention of leaf blights on the growth of nursery cherries and pears.** Amer. Nurseryman $31^5$: 110. May, 1920.—Data are given showing that 57.3 per cent of cherry trees sprayed in the nursery with Bordeaux mixture were over 3 feet in height, while only 23.5 per cent of the unsprayed trees, used as check, attained a height of 3 feet. Similar results were secured with Bartlett pear trees.—*J. H. Gourley.*

140. Young, Floyd D. **Frost and the prevention of damage by it.** U. S. Dept. Agric. Farmers' Bull. 1096. *48 p., 24 fig.* 1920.

### FLORICULTURE AND ORNAMENTAL HORTICULTURE

141. Anonymous. **Cotoneaster acutifolia.** Amer. Nurseryman 31²: 35. February, 1920.

142. Anonymous. **Cotoneaster acutifolia.** Nation. Nurseryman 28³: 53. March, 1920.

143. Anonymous. **Severe winter effect.** Amer. Nurseryman 31⁶: 138. June, 1920.—It is stated that very great losses to ornamental plants of all kinds were experienced following the winter of 1919–20 in the environment of Philadelphia. It is estimated that the loss in that section alone is more than $1,000,000.—*J. H. Gourley.*

### VEGETABLE CULTURE

144. Lundberg, Joh. Fr. **Svalöfs Koloni-Stensärt. [Svalöf's "Koloni-Stens" pea.]** Sver. Utsädesf. Tidskr. 30: 30–31. 1920.—Origin and description of a new variety of marrow pea of very high quality. It is a selection from the Stens pea, a high-quality but rather unproductive variety.—*E. G. Anderson.*

145. Mathieu, E. **Tuba root (Derris elliptica) as an insecticide.** Gardens' Bull. Straits Settlements 2: 192–197. 1920.—Results are recorded for employing a decoction or powder of tuba root as an insecticide in vegetable cultivation.—*T. F. Chipp.*

### HORTICULTURE PRODUCTS

146. Dunbar, P. B., and H. A. Lepper. **Report on fruit products.** Jour. Assoc. Official Agric. Chem. 3: 402–409. 1920.—Malic and citric acid determinations.—*F. M. Schertz.*

147. Eaton, B. J. **Tung oil or Chinese wood oil and candlenut oil from Aleurites spp.** Agric. Bull. Federated Malay States 7: 162–165. 1919.—The chemical characteristics, extraction of oil, and prospects of cultivation of this crop in Malaya are considered.—*T. F. Chipp.*

148. Ravaz, L. **Le defoxage des producteurs directs. [Removal of the objectionable taste of imported wines.]** Ann. École Nation. Agric. Montpellier 17: 71–80. (July, 1918.) July, 1919.—Several methods are given by which imported wines, especially those from America, are rendered more palatable.—*F. F. Halma.*

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

149. Beals, A. T. **Tortula pagorum (Milde) DeNot., near Harper's Ferry, West Virginia.** Bryologist 23: 33–35. *Pl. 1, fig. 1.* 1920.—The article reports the second collection in America of a rare European moss, as well as the occurrence of *Fabronia octoblepharis* (Schleich.) Schwaegr. The plate and figure are from photomicrographs.—*E. B. Chamberlain.*

150. Börgesen, F., and C. Raunkiaer. **Mosses and lichens collected in the former Danish West Indies.** Dansk Bot. Ark. 2⁹: *18 p.*, 1918.—The mosses were determined by V. F. Brotherus and number 24 species, *Trichostomum perviride* Broth. being described as new. These added to the species listed by Mrs. Britton give a total of 38 species now known from the islands, 4 of which are endemic. The lichens were determined by E. Wainio and number 156 species, 59 of which were described as new in Wainio's "Addidamente ad Lichenographiam Antillarum illustrandam" (Ann. Acad. Sci. Fenn. 6. Helsingfors, 1915).—*A. Gundersen.*

151. Collins, E. J. **Sex segregation in the Bryophyta.** Jour. Genetics 8: 130–146. *Pl. 6, 5 fig.* 1919.—See Bot. Absts. 3, Entry 2103.

152. Corbière, L. **Deux mousses africaines également françaises.** [**Two African mosses occurring likewise in France.**] Rev. Bryologique 41: 99. 1914. [Issued in 1920.]—This is the conclusion of a paper already abstracted in part. (See Bot. Absts. 5, Entry 619.) The discovery of *Fissidens Moureti* Corb. in the department of Var in southern France is announced. This species was discovered by Mouret in Morocco and has since been reported from both Madeira and Spain. It is interesting to note that Mouret was also the collector of the French specimens. As a probable ally of *F. Moureti*, the author mentions *F. Warnstorfii* Fleisch., a species based on specimens from the vicinity of Naples but since recorded from Portugal. [See also Bot. Absts. 6, Entry 158.]—*A. W. Evans.*

153. Familler, I. **Bemerkungen über bayerische Moose.** [**Notes on Bavarian mosses.**] Krypt. Forsch. Bayerische Bot. Ges. 3: 166–167. *1 fig.* 1918.—The author notes the occurrence, in the vicinity of Regensburg, of *Orthotrichum diaphanum*, forma *aquaticum* (Davies) Venturi, a moss new to Germany. The variable leaf-apices of this form are figured and commented upon, and three other mosses accompanying the *Orthotrichum* are listed. The paper gives also new Bavarian stations for *Tortula obtusifolia* Schleich. and *Plagiothecium Ruthei* Limpr. and corrects two previously published records, one for a moss and the other for a liverwort.—*A. W. Evans.*

154. Groves, James. **Sex-terms for plants.** Jour. Botany 58: 55–56. 1920.—See Bot. Absts. 5, Entry 560.

155. Holzinger, John M. **Bartramiopsis Lescurii.** Bryologist 23: 35–36. 1920.—Kindberg, in founding the genus *Bartramiopsis* for *Atrichum Lescurii* James, misquoted James and apparently made the description from other than typical material. The genus should be maintained, but the authority for the combination given above is Cardot & Thériot. *B. sitkana* Kindb. is only a synonym.—*E. B. Chamberlain.*

156. Luisier, A. **Les mousses de Madère.** [**Mosses of Madeira.**] Broteria, Ser. Bot. 18: 5–22. 1920.—This is the seventh of a series of articles containing a complete discussion of the moss flora of Madeira, and includes the genera *Thamnium* to *Plagiothecium* (in part). No new forms are described, but extended discussion and critical notes are given upon *Thamnium canariense* R. & C., *Lepidopilum fontanum* Mitt., *L. virens* Card., *Amblystegium madeirense* Mitt., *Campylium serratum* Card. & Wint., *Gollania Berthelotiana* (Mont.) Broth., and *Stereodon canariensis* Mitt. In most of these cases there are copious quotations from original or out-of-the-way sources. [See Bot. Absts. 1, Entry 757; 3, Entries 2477 and 2478; and 5, Entry 625.]—*E. B. Chamberlain.*

157. Mola, Pasquale. **Flora delle acque Sarde. Contributo delle piante idrofite ed igrofite della Sardegna.** [**Flora of the Sardinian waters. Hydrophytes and Hygrophytes of Sardinia.**] Atti R. Accad. Sci. Torino 54: 478–502. 1918–1919.—See Bot. Absts. 4, Entry 1025.

158. Potier de la Varde, R. **Observations sur quelques espèces du genre Fissidens.** [**Observations on certain species of the genus Fissidens.**] Rev. Bryologique 41: 94–98. *Pl. 2.* 1914. [Issued in 1920.]—The first part of this paper has already been abstracted. (See Bot. Absts. 5, Entry 628.) In this second and concluding part, the discussion of *F. tamarindifolius* is continued, certain specimens from Brittany being especially considered. These are referred to *F. impar*, as var. *Camusi* var. nov., and several distinct forms of this variety are described and figured. According to the author's summary *F. tamarindifolius*, as understood by writers, is not a definite species but includes forms and varieties of *F. incurvus* Starke, *F. inconstans* Schimp. and *F. impar* Mitt. At the close of the paper the status of *F. gracilis* (La Pyl). Brid. is discussed, and the conclusion is reached that it represents a slender and delicate variety of *F. incurvus*. It was discovered in 1814 by La Pylie at Fougères, France, and has not been collected since. [See also Bot. Absts. 6, Entry 152.]—*A. W. Evans.*

159. Taylor, A. **Mosses as formers of tufa and floating islands.** Bryologist 22: 38–39. 1919.—See Bot. Absts. 4, Entry 306.

160. Thériot, I. **Notes bryologiques. I. Syrrhopodon Taylori Schwaegr.** Bull. Soc. Bot. Genève 11: 24–28. 1919.—The original description of *Syrrhopodon Taylori* Schwaegr. is erroneous as to the peristome. An examination of the type specimen leaves no doubt concerning the identity of the plant, which is a species of *Leucoloma*, according to the description of this genus by Mitten, and the species in question is properly named *Leucoloma Taylori* (Schwaegr.) Mitt. *Leucoloma sarcotrichum* C. Müll. is synonymous.—*W. H. Emig.*

161. Thériot, I. **Notes bryologiques. II. Fabronia longidens Duby.** Bull. Soc. Bot. Genève 11: 28–29. 1919.—The moss described by Duby, in 1867, as *Fabronia longidens* is *Dimerodontium pellucidum* (Hook.) Mitt. The specific name *pellucidum* is misleading, for the color of the moss is dull green like that of the species of *Leskea*.—*W. H. Emig.*

162. Twiss, W. C. **A study of the plastids and mitochondria in Preissia and corn.** Amer. Jour. Bot. 6: 217–234. *Pl. 33–34.* 1919.—See Bot. Absts. 3, Entry 1942.

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

### MYXOMYCETES

163. Lister, G. **The Mycetozoa, a short history of their study in Britain, an account of their habitats generally, and a list of species recorded from Essex.** *4 + 54 p.* The Essex Field Club, Stratford; Simpkin, Marshall & Co., Ltd.: London, 1918. [Essex Field Club Special Memoirs, Vol. 6.]

### BACTERIA

164. Atkins, Kenneth N. **A modification of the Gram stain.** [Abstract.] Absts. Bact. 4: 4. 1920.—"A stable staining solution consists of a 1 per cent aqueous solution aniline sulphate, 3 parts; saturated alcoholic solution Gentian violet, 1 part. The iodine solution contains 2 grams iodine, 10 cc. normal sodium hydroxide solution, water 90 cc. Time for staining and treatment with modified iodine solution, 1 minute each." [Author's abst. of paper read before Soc. Amer. Bact.]

165. Bronfenbrenner, J. **Some improvements in the methods for the identification of bacteria.** [Abstract.] Absts. Bact. 3: 6. 1919.—Endo agar as a stock medium is unsatisfactory because of instability of color. By substituting a "proper mixture" of rosolic acid and China blue for the sodium sulphite-fuchsin mixture, as an indicator in lactose agar, a better medium is secured. The agar is practically colorless. Organisms which ferment lactose are promptly indicated by intense blue color of the colony, those which do not, remain colorless or pink. For isolation, buffer is adjusted to permit earliest possible detection.—Identification by means of carbohydrate fermentation tests is hastened by use of "microplates." Single drops of the media to be tested are placed in a single Petri dish at points previously touched with a needle bearing the organism to be tested. The method is also useful in testing for gelatin liquefaction, starch hydrolysis, hydrogen-sulfid formation, reduction of nitrates, etc. [From author's absts. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

166. Bronfenbrenner, J., M. J. Schlesinger, and D. Soletsky. **Study in China-blue-rosolic-acid indicator.** [Abstract.] Absts. Bact. 4: 12. 1920.

167. Browne, William W. **The isolation of bacteria from salt and salted foods.** [Abstract.] Absts. Bact. 4: 11–12. 1920.—Reddening of salted fish is due to growth of 2 organisms, a spirochete producing an opaque pink coloration and a bacillus producing a transparent red coloration. They are intimately associated and are difficult to separate in pure culture. No growth occurs on media containing less than 16 per cent sea salt; optimum concentration seems to be saturation; optimum temperature, 50° to 55°C. Both are strictly aerobic, both difficult to stain, and neither affected by sunlight (8 hours). Morphology of both organisms depends on concentration of salt, the largest forms (14$\mu$) appearing on saturated solutions and the shortest (2$\mu$) on media of 18-per-cent concentration.—[From author's abst. of paper read at scientific session, Soc. Amer. Bact.]—*D. Reddick.*

168. Conn, H. J. **Report of Committee on Descriptive Chart.** [Abstract.] Absts. Bact. 4: 1. 1920.—The report is to be published in full in *Jour. Bact.*

169. Davison, Wilburt C. **The aerobic flora of dysentery stools in adults and children.** [Abstract.] Absts. Bact. 4: 15. 1920.

170. Downs, Cornelia Mitchell. **Typing of Bacillus typhosus.** [Abstract.] Absts. Bact. 4: 19. 1920.—"In the course of routine diagnostic work it was observed that some of the sera used for identifying typhoid failed to agglutinate certain strains. This fact seemed to indicate that there might be types of typhoid bacilli. The strains used were from as widely separates sources as possible; 5 were isolated in Kansas, 4 from Europe, 1 from California, the others from various parts of the East and middle West. Culturally they were identical, with the exception of 3 strains, which gave a deep blue color to litmus milk after a slight initial acidity lasting 4 days; the others remained pink.—Representative strains were selected and rabbits immunised. Cross agglutinations were made using all the organisms against each serum. It was found that they readily fell into 4 groups. Groups I, II, and III are quite distinct, while group IV is agglutinated by both type I and II sera."—[Author's abst. of paper read before Soc. Amer. Bact.]

171. Eaton, Paul. **A device for the rapid measurement of bacteria.** [Abstract.] Absts. Bact. 4: 4. 1920.—A mechanical stage the movement of which is brought about by the use of a screw and nut, the screw being actuated by a rather large worm-wheel. The mechanical motions which bring about movement of stage are recorded by a counter of the "mile-register" type. [From author's absts. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

172. Elliott, Charlotte. **Halo-blight of oats.** Jour. Agric. Res. 19: 139–172. *Pl. C (col.) and 26–35.* 1920.—See Bot. Absts. 6, Entry 230.

173. Hall, Ivan C. **Methylene blue as a criterion of anaerobiosis.** [Abstract.] Absts. Bact. 4: 4. 1920.

174. Jones, D. H. **Continued studies of some azotobacters.** [Abstract.] Absts. Bact. 4: 6. 1920.—Four varieties of *Azotobacter* isolated from soil have been studied and are found to have a very complex life cycle with extreme polymorphism. The various forms encountered are briefly enumerated. [From author's abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

175. Levine, Max. **Some differential characters of the group of dysentery bacilli.** [Abstract.] Absts. Bact. 4: 15. 1920.—Six species are recognized: *Bact. dysenteriae* (Shiga-Kruse), *Bact. ambiguum*, *Bact. flexneri*, *Bact. sonnei*, *Bact. dispar*, and *Bact. alkalescens*. The interrelationships and cultural differential characters are indicated in a table. [From author's abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

176. MacInnes, L. R., and H. H. Randell. **Dairy produce factory premises and manufacturing processes. The application of scientific methods to their examination.** Agric. Gaz. New South Wales 31: 333–337. *8 fig.* 1920.

177. Monfort, W. F., and M. C. Perry. **Some atypical colon-aerogenes forms isolated from natural waters.** [Abstract.] Absts. Bact. 4: 8. 1920.—"The purpose of sanitary bacteriology of water supplies is distinct from that of systematic bacteriology. Variations from types now accepted as indicative of fecal pollution are so manifold that further study of these variants prior to complete rejuvenation is essential to their correlation with known pollution.—The attempt to reduce the members of the colon-aerogenes group to 4 types (non-fecal and fecal aerogenes, cloacae, and fecal *B. coli*) is futile so far as practical application in judging water supplies is concerned.—There are intermediate forms, of varying methyl-red reaction, furnishing transitions from one to the other type, which may correlate with their late environment."—Some of the variations are stated and experimental data on technique are summarized. [From author's abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

178. Neill, James, and Arao Itano. **A microscopical method for anaerobic cultivation.** [Abstract.] Absts. Bact. 4: 4. 1920.—An hermetic cell, similar to the Van Tieghem cell, is used, oxygen being removed by use of alkaline pyrogallic acid. [From authors' abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

179. Normington, Ruth. **Studies in the heat resistant organisms of cold packed canned peas.** Michigan Agric. Exp. Sta. Tech. Bull. 47: 1–33. 1919.—Discusses the bacteria found in canned peas, describing the cultural characters of nine or more species isolated and studied. These are spore producers and capable of withstanding high temperatures.—*E. A. Bessey.*

180. Orr, Paul F. **Some observations on the biological characteristics of Bacillus botulinus and its toxins.** [Abstract.] Absts. Bact. 4: 10. 1920.—Many of the characteristics exhibited by 16 strains of *B. botulinus* that have been studied differ materially from the accepted description of this organism.—The optimum temperature for growth of all of the strains has invariably been found to be about 37°C. At this temperature an abundant growth takes place within 16 hours and spore formation usually begins within 36 hours; however, the spore formation varies with different strains. When grown in the ordinary dextrose media, such as agar, gelatin and bouillon, *B. botulinus* produces acid, spores are not formed and consequently the cultures soon lose their vitality. In the sugar free media, spores are readily formed and the cultures have remained viable at 37°C. for a period of 2 years.—Of the 16 strains studied originally 11 produced toxin. During the course of a year of cultivation one has entirely lost its ability to produce toxin. Toxin is readily formed at 37°C. by all of the toxic strains, and can be demonstrated after 20 hours of growth.—This toxin is destroyed at 80°C. within 2 minutes. The temperature coefficient of the destruction of the toxin by heat was found to lie between 6 and 8.5 for a rise of 10°C.—[From author's abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

181. Rivers, T. M. **What is an influenza bacillus?** [Abstract.] Absts. Bact. 4: 14. 1920.—"The question asked in the title can be answered in one sentence. There is only one true *B. influenzae*, existing in name only, and that is the first one grown and described by Pfeiffer, as neither he nor any one else has ever shown any of the subsequent strains to be the same as the first. He did, however, draw the attention of bacteriologists to a group of hemoglobinophilic bacilli, which has caused many contentions and hard feelings and about which no more is known now than nearly thirty years ago."—"The Gram-negative, non-motile hemoglobinophilic bacilli can be classified biologically by reactions which admit of subdivisions of the group."—[From author's abst. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

182. Treece, E. L. **A substitute for adonite in the determination of fecal and non-fecal strains of the colon-aerogenes group.** [Abstract.] Absts. Bact. 4: 9. 1920.—"A peptone gelatine as follows: 12 per cent gelatine, 2 per cent peptone, 0.5 per cent meat extract, tubed and sterilized as for ordinary gelatine was found to correlate the fermentation of adonite in determining fecal and non-fecal strains of the colon-aerogenes group; positive results being

indicated by a line of from 4 to 8 bubbles extending down the line of inoculation within 48 hours at 20°C.—Of 60 food strains studied 32 were of the aerogenes type and 20 of these (or 62.5 per cent) were positive in adonite and the same number, 62.5 per cent, produced gas in peptone gelatine. Of the 17 strains of aerogenes that were Voges-Proskauer positive, 82.3 per cent were adonite fermenters and 88.2 per cent gave gas in peptone gelatine. Of 37 known fecal strains studied 36 were negative in adonite and 36 did not produce gas on peptone gelatine."—[Author's abst. of paper read before Soc. Amer. Bact.]

183. W[inslow], C.-E. A. **The lactic acid bacteria.** [Rev. of: Orla-Jensen, S. **The lactic acid bacteria.** Mem. Acad. R. Sci. et Let. Danemark (Sect. Sci.) VIII, 5: 81–196. *51 pl.* 1919.] Absts. Bact. 4: 102. 1920.—"The bio-chemical portion of this monograph represents a contribution of the highest value to our knowledge of the physiology of a puzzling bacterial complex. From a systematic standpoint it is less illuminating. The evidence for combining the streptococci and the Bulgarian bacillus group in one family is suggestive, but hardly conclusive; while as in previous communications Jensen appears entirely innocent of any knowledge of the principles of biological nomenclature or of any respect for the work of previous investigators. His genus *Betacoccus* is apparently *Leuconostoc* of van Tieghem, and his *Thermobacterium* is certainly *Lactobacillus* Beijerinck; while many of his specific names are merely confusing synonyms of perfectly valid names given by previous investigators."—*D. Reddick.*

184. Winslow, C.-E. A., *Chairman*, Jean Broadhurst, R. E. Buchanan, Charles Krumwiede, Jr., L. A. Rogers, and G. H. Smith. **Abstract of final report of the committee on characterization and classification of bacterial types.** [Abstract.] Absts. Bact. 4: 1. 1920. —"As a result of criticisms of the preliminary report of the committee (Jour. Bact. 2: 505) made at, and subsequent to, the 1917 meeting of the Society, the committee presented a revised classification of the families and genera of the Actinomycetales and Eubacteriales, 38 genera being finally included, with type species for each. In addition to the classification itself the committee presented an artificial key to the families and genera recognized, and a generic index of the commoner species of bacteria with the names ordinarily used referred to their proper genera under the proposed classification. The committee recommended that the following names be adopted by the Society as approved genera:

Acetobacter Fuhrmann
Actinomyces Harz
Bacillus Cohn
Bacterium Ehrenberg
Chromobacterium Bergonzini
Clostridium Prazmowski
Erythrobacillus Fortineau
Leptoteichia Trevisan
Leuconostoc Van Tieghan
Micrococcus Cohn
Rhizobium Frank
Sarcina Goodsir
Spirillum Ehrenberg
Staphylococcus Rosenbach
Streptococcus Rosenbach
Vibrio Mueller

and that The Committee on Characterization and Classification of Bacterial Types be discharged and that a new committee on Bacterial Taxonomy be appointed (1) to study and report to the Society from time to time in regard to problems of nomenclature, including such revisions of the nomenclature in the present report as may seem necessary; and (2) to take the proper steps to secure action at the next International Botanical Congress leading to the general ends contemplated in the 1916 recommendations of the Society.—(a) That French, English and German may be substituted for Latin in the diagnosis of bacterial species. (b) That the date of publication of the third edition of Zoph's Spaltpilze (1883) be considered the beginning of bacterial nomenclature for the purpose of determining priority, with the exception of a definite list of genera conservanda. (c) That such of the approved generic names specified above as may be found to require such action be recognized as genera conservanda in bacterial taxonomy.—Both the recommendations of the Committee were adopted by the Society."—[Abst. by C.-E. A. Winslow of report made to Soc. Amer. Bact.]

## LICHENS

185. Herre, Albert C. **Alaskan notes.** Bryologist 23: 37–38. 1920.—A list of twenty-eight species of lichens from Alaska, with localities.—*E. B. Chamberlain.*

186. Steiner, J. **Flechten aus Transkaukasien. [Lichens from Transcaucasia.]** Ann. Mycol. 17: 1-32. 1919.—The author gives a list of some two hundred lichens which he received from G. Woronoff for identification. The following new species and varieties are listed: *Dermatocarpon* (*Endopyrenium rufescens* (Ach.) Th. Fr. var. *pruinatum* Stnr.; *Leptorhaphis Buxi* Stnr.; *Lithographa deplanata* Stnr.; *Lecidea* (*Eulecidea*) *goniophiliza* Stnr.; *Lecidea* (*Eulecidea*) *phaea* (Flot. apud Krb.) Nyl. f. *interrupta* Stnr. nov. f.; *Lecanora* (*Aspicilia*) *sphaerothallina* Stnr. var. *plicatula* Stnr.; *Lecanora* (*Aspicilia*) *esculenta* (Pall.) Eversm. var. *Erivanensis* Sntr.; *Lecanora* (*Aspicilia*) *subdepressa* Nyl. var. *adgrediens* Stnr.; *Lecanora* (*Aspicilia*) *squamulosa* Stnr.; *Lecanora* (*Aspicilia*) *epiglypta* Nyl. var. *rupta* Stnr.; *Lecanora solorinoides* Stnr.; *Parmelia* (*Cyclocheilae*) *glabra* (Schaer.) Nyl. var. *epilosa* Stnr.; *Caloplaca irrubescens* (Nyl.) A. Zahlbr. var. *disjecta* Stnr.; *Physcia caucasica* Stnr.; *Buellia Zahlbruckneri* Stnr. var. *microspora* Stnr.—*Fred C. Werkenthin.*

## FUNGI

187. Arnaud, G. **La famille des Parodiellinacées (Pyrénomycètes). [The family Parodiellinaceae of the Pyrenomycetes.]** Compt. Rend. Acad. Sci. Paris 170: 202–204. 1920.—In harmony with his previous study the author seeks to establish the family Parodiellinaceae, in the order Hypocreales. This family is to consist of four tribes organised about the genera *Bagnisiopsis*, *Parodiellina*, *Parodiopsis*, and *Erysiphe*, the last named to constitute the nucleus of the tribe, which is equivalent to the well established group, the Erysiphaceae. The family is held to possess unity due to the parasitic habit of its members upon vascular plants, especially their leaves. There are present internal haustoria, and a pigment occurs at least in the conceptacles. Conidiophores are common in the family. Two tribes have external mycelia, its presence seeming to have no definite relation to development in a rainy region as is the case in the Microthyriaceae. The Erysipheae represent the climax of evolution in this group, the simplicity of their conceptacles being apparently the result of reduction on the part of the stroma.—*C. H. and W. K. Farr.*

188. Bardie, A. **Excursion mycologique de la Société Linnéenne à Léognan le 12 Novembre 1916, nos vieilles forêts; nécessité de leur conservation. [The mycological excursion of the Linnean Society to Léognan, November 12, 1916.]** Actes Soc. Linneenne Bordeaux (Proces-verbaux) 69: 105–113. 1915–16. [Received May, 1920.]—See Bot. Absts. 6, Entry 80.

189. Bose, S. R. **Fungi of Bengal. III. Polyporaceae of Bengal.** Carmichael Med. Coll. Belgachia Bull. 1. *5 p., 12 pl.* 1920.—Twelve species of polypores are described and each is illustrated with 3 or more halftones. The 12 illustrations are arranged on 7 special insert sheets. The specimens have been compared with authentic material in the herbarium of the Peradenya Bot. Gard., Ceylon. The species are: *Fomes applanatus*, *F. pallidus*, *Lenzites repanda*, *Polyporus licnoides*, *P. emerici*, *P. secernibilis*, *P. zonalis*, *Poria diversiporus*, *Trametes lactinea*, *T. versatilis*, *T. occidentalis*, *T. persooni*. [Part I was published in: Proc. Indian Assoc. Cultiv. Sci. 4: part 4, 1918. Part II appeared in the Proceedings of the Science Convention, 1918, of the same Association.]—*D. Reddick.*

190. Boyer, G. **Sur l'existence et les principaux caractères du mycélium des champignons qui paraissent en être dépourvus et en particulier de celui des tubéracées. [Concerning the ex'stence and the principal characters of the mycelium of fungi which appear to be sterile and in particular those of the Tuberaceae.]** Actes Soc. Linn. Bordeaux (Proces-verbaux) 69: 94–97. 1915–16.—The delicate mycelium of many species of *Amanita* and *Boletus*, if followed for a distance of one to several decimeters, leads to mycorhiza of tree roots. Many of the truffles and similar fungi with mycelium that is scarcely apparent possess mycelium which extends into the earth and in many cases probably connect with the mycorhiza of the neighboring trees.—*W. H. Emig.*

191. Burt, E. A. **The Thelephoraceae of North America. XI. Tulasnella, Veluticeps, Mycobonia, Epithele, and Lachnocladium.** Ann. Missouri Bot. Gard. 6: 253-280. *Pl. 5, fig. 1-15.* 1919.—In the monograph of these 5 genera two species, *Epithele sulphurea* and *Lachnocladium erectum* are described as new. *Aleurodiscus tabacinus* Cooke is newly combined as *Veluticeps tabacina* (Cooke) Burt and *Clavaria bicolor* Peck as *Lachnocladium bicolor* (Peck) Burt. *Pterula setosa* Peck is excluded from *Lachnocladium* to which it had been transferred by Saccardo.—*S. M. Zeller.*

192. Chaborski, Gabriela. **Recherches sur les levures thermophile et cryophiles. [Studies on thermophile and cryophile yeasts.]** Bull. Soc. Bot. Genève 11: 70-116. *1 pl., 32 fig.* 1919.—Yeasts were obtained from fig and banana fruits and from palm and birch sap. From the fig two new species of yeasts were isolated: *Zygosaccharomyces ficicola* Chaborsky n. sp. and *Torula botryoidea* Chaborski n. sp. From the banana a species representing a new genus of fungi was obtained: *Asporomyces asporus* Chaborski n. sp. From the sugar of *Arenga saccharifera* and the birch tree many cultures of undetermined *Mycoderma* were isolated.—*W. H. Emig.*

193. Chipp, T. F. **Echinodia theobromae Pat.** Gardens' Bull. Straits Settlements 2: 199. 1920.—More mature specimens of this new species confirm the opinion that it is a stilboid form of a polypore.—*T. F. Chipp.*

194. Dietel, P. **Über Puccinia obscura Schröt. und einige verwandte Puccinien auf Luzula. [Puccinia obscura Schröt. and related Pucciniae on Luzula.]** Ann. Mycol. 17: 48-58. 1919.—According to an investigation made by the author the urediniospores found on *Luzula maxima* and those of *Puccinia obscura* Schröt. differ considerably in size. Based on measurements of 200 spores each, it was found that the urediniospores of *Puccinia obscura* are 22-25 x18-20$\mu$, while those found on *Luzula maxima* measure 23-40x17-29$\mu$. The author regards the fungus on this host as distinct, names it *Puccinia Luzulae maximae* Diet., and gives a detailed description. The teliospores are capable of germinating the year in which they are formed. The author also gives a description of a rust found on *Luzula Alopecurus* by A. Philippi, and names it *Puccinia luzulina* Syd. n. sp.—*Fred C. Werkenthin.*

195. Doidge, Ethel M. **South African Perisporiaceae. III. Notes on four species of Meliola hitherto unrecorded from South Africa.** Trans. Roy. Soc. South Africa 8: 107-110. *Pl. 4.* 1920.—Four species of *Meliola* hitherto unrecorded from South Africa, namely *Meliola malacotricha* Speg., *M. palmicola* Wint., *M. bicornis* Wint., and a variety of *M. geniculata* Syd. & Butl., have been identified in collections made in Natal and in the eastern part of the Cape Province, and are here described. [See also next following Entries, 196 and 197.]—*E. M. Doidge.*

196. Doidge, Ethel M. **South African Perisporiaceae. IV. New species from the Coast Districts.** Trans. Roy. Soc. South Africa 8: 111-115. *Pl. 5-6.* 1920.—This paper consists of descriptions and illustrations of 9 new species, 6 of which belong to the genus *Meliola.* [See also next preceding and next following Entries, 195 and 197.]—*E. M. Doidge.*

197. Doidge, Ethel M. **South African Perisporaceae. V. Notes on an interesting collection from Natal.** Trans. Roy. Soc. South Africa 8: 137-143. *Pl. 7-8.* 1920.—Eight new species are described and a number of species previously described are recorded on hitherto unreported hosts. [See also next preceding Entries, 195 and 196.]—*E. M. Doidge.*

198. Doidge, Ethel M. **Mycological notes I.** Trans. Roy. Soc. South Africa 8: 117-119. 1920.—The distribution of *Asterodothis solaris* and its occurrence on a number of different hosts are recorded. *Spegazzinia Meliolae* Zimm., *Phaeosphaerelle senniana* Sacc. and *Isariopsis griseola* Sacc. are recorded as occurring in South Africa and two new species, *Dothidasteromella contorta* and *Gloniella multiseptata* are described.—*E. M. Doidge.*

199. DOIDGE, ETHEL M. **Meliolaster, a new genus of the Microthyriaceae.** Trans. Roy. Soc. South Africa 8: 121–123. 1920.—This is a genus resembling *Meliola* in its mycelium and spores, and *Asterina* in the form of its thyriothecium.—*E. M. Doidge.*

200. MATSUMOTO, T. **Culture experiments with Melampsora in Japan.** Ann. Missouri Bot. Gard. 6: 309–316. *Fig. 1–3.* 1919.—Cross inoculations of teliospores of a *Melampsora* from *Salix Urbaniana* on *Larix decidua* and caeomaspores from *L. decidua* on *S. Urbaniana* were successful. *Melampsora Larici-Urbaniana* is described as new. *M. Larici-populina* Kleb. is found in Japan on *Populus balsamifera.* A species on *Salix babylonica,* having a caeoma stage on the leaves of *Chelidonium majus,* has not been definitely placed taxonomically, while a *Melampsora* on *Salix Capraea* seems to have a caeoma stage on the leaves of neither *Larix* nor *Abies.*—*S. M. Zeller.*

201. MATTIROLO, O. **La Daldinia concentrica nella Torbiera di Montorfano. [Daldinia concentrica in a peat bog at Montorfano.]** Nuovo Gior. Bot. Ital. 26: 142–146. 1919.—The fruit body of this fungus was found in the bog of Montorfano and was first taken for a fruit of the horse-chestnut. The walls of the hyphal strands had become impregnated with graphic acid and were in a perfect state of preservation.—*E. Artschwager.*

202. PEGLION, VITTORIO. **La forma ascofora (Microsphaera quercina) dell'oidio della quercia nel Bolognese. [Perithecial form of the oak mildew.]** Atti R. Accad. Lincei [Roma] Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^2$: 197–198. 1919.—The perithecial stage of *Oidium quercinum* Thüm., on oak and cerris was collected near Bologna and found to be *Microsphaera quercina* (Schw.) Burr.—*F. M. Blodgett.*

203. PUTTERILL, V. A. **A new apple tree canker.** South African Jour. Sci. 16: 256–271. *Pl. 21–30, 6 fig.* 1919.—See Bot. Absts. 6, Entry 251.

204. RICK, J. **Contributio ad monographiam agaricacearum brasiliensium. [Contribution towards a monograph of Brazilian agarics.]** Broteria (Ser. Bot.) 18: 48. 1920.—This is the first page only of an article to be continued in the next issue. *Lepiota albo-squamosa* and *L. Hypholoma* are described as new.—*E. B. Chamberlain.*

205. RODWAY, L. **Notes and additions to the fungus flora of Tasmania.** Papers Proc. Roy. Soc. Tasmania 1919: 110–116. 1920.—The following new species are described: *Hydnangium microsporium, H. densum, Hysterangium atratum, H. obtusum, Secotium ochraceum, Orbilia crystalina, Spragueola mucida, Paurocotylis niveus, Sphaerosoma tasmanica, Dendrodochium molle.*—*J. H. Faull.*

206. SYDOW, H., AND P. SYDOW. **Mykologische Mitteilungen. [Mycological announcements.]** Ann. Mycol. 17: 33–47. *2 fig.* 1919.—The following new species and new genera of fungi are listed: *Septobasidium sulphurellum* Syd.; *Puccinia Tetranthi* Syd.; *Puccinia Haloscíadis* Syd.; *Puccinia Paulsenii* Syd.; *Peridermium praelongum* Syd.; *Peridermium japonicum* Syd.; *Phaeodimeriella curviseta* Syd.; *Asterina diaphorella* Syd.; *Titanella* Syd.; *Titanella luzonensis* (P. Henn.) Syd.; previously described as *Julella luzonensis* P. Henn.; *Titanella illicina* (Syd. et Butl.) Syd. previously described as *Pleomassaria ilicina* Syd. et Butl.; *Titanella grandis* Syd. previously named *Pleomassaria grandis* Syd.; and *Titanella intermedia* Syd. previously called *Julella intermedia* Syd.; *Starbaeckiella* Syd.; *Starbaeckiella massariospora* (Starb.) Syd. = (*Clypeosphaeria? massariospora* Starb.); *Starbaeckiella Mangiferae* Syd. = (*Resellinia Mangiferae* Syd.); *Starbaeckiella Elmeri* Syd. = (*Anthostomella Elmeri* Syd.); *Starbaeckiella Bakeriana* (Rehm) Syd. = (*Clypeosphaeria Bakeriana* Rehm); *Starbaeckiella Palaquii* (Ricker) Syd. = (*Trematosphaeria Palaquii* Ricker); *Microscypha* Syd.; *Microscypha grisella* (Rehm) Syd. (*Helotium grisellum* Rehm); *Xenopeltis* Syd.; *Xenopeltis philippinensis* Syd. illustrated with two figures in the text.—The author adds to this list the names of seven genera which had to be renamed as follows: *Linostoma* v. Hoehn to *Ophiostoma* Syd.; *Apio-*

*sporella* Speg. to *Apiocarpella* Syd.; *Kriegeria* Bres. to *Xenogloea* Syd.; *Willia* E. Chr. Hansen to *Hansenula* Syd.; *Venturiella* Speg. to *Neoventuria* Syd.; *Chaetopeltis* Sacc. to *Tassia* Syd.; and *Arthrobotryum* Rostr. to *Gonyella* Syd.—*Fred C. Werkenthin.*

207. Thom, Charles, and Margaret B. Church. **The identity of Aspergillus oryzae.** [Abstract.] Absts. Bact. 4:3. 1920.—*Aspergillus oryzae* Ahlburg was described as the yellow-green mold used in the sake industry of the Orient. As identified by the description of Wehmer, it is a species with fairly sharp limits. The Japanese, however, use the same name for the organism or organisms concerned in the fermentation of soy sauce or shoyu and related industries. Our collection includes many hundreds of yellow-green strains belonging to this group, ranging from the culture of *A. oryzae* distributed by Wehmer to authentic cultures used in the shoyu fermentation and cultures representing *A. flavus* as interpreted by Brefeld. The Japanese workers have clearly used the name *A. oryzae* in their factories and in their experimental work as covering this entire group, although they recognize that the various members of the group are very different in their appearance and physiological activity. Certain common characters link this series into a natural group. All show the same markings of stalk wall and conidial wall. All show the same general arrangement of fruiting parts. All show a particular yellow coloring matter which is more or less supplemented throughout the group with a true green. Pronounced differences are found in colony appearance, in shades of color, in measurements of stalk, vesicle and conidia. Among these the sake organism represents one extreme, with its long stalks, heads with principally simple sterigmata and large conidia; *Aspergillus parasiticus* of Speare is at the other extreme with short stalks and intense green color. Each strain should be carefully identified either by varietal name or by adequate description before experimental results using it can be properly valued. The name *Aspergillus oryzae* unmodified should be reserved for the organism of the sake fermentation.—Members of this group are universally distributed. *A. flavus* and its allies are consistently found in the soil and widely distributed in foodstuffs, as shown by our collections from Europe, Asia and many places in America. *A. oryzae* in the strict sense is more limited since we have, only occasionally obtained it from sources other than the Oriental fermentation industries. —[Authors' abst. of paper read before Soc. Amer. Bact.]

208. Torrend, C. **Les polyporacées du Brésil. [The Polyporaceae of Brazil.]** Broteria (Ser. Bot.) 18: 23–43. *4 pl.* 1920.—A discussion of the Brazilian species of the genus *Gandoderma* Karst., as limited by C. G. Lloyd, with a key to the species and notes on 17 species and many extra-limital forms. The plates are from photographs, illustrating gross characters only. The forms *hemisphaericum, annulatum,* and *rubellum* of *G. lucidum* are apparently proposed as new. The series is apparently to be continued.—*E. B. Chamberlain.*

209. Van der Bijl, P. A. **The systematic position of the fungus causing root disease of sugar cane in Natal and Zululand.** South African Jour. Sci. 16: 204–206. 1919.—The fungus causing root disease of sugar cane in Natal and Zululand is now definitely referred to Johnston's *Himantia stellifera,* "the stellate crystal fungus." This fungus also probably occurs on indigenous grasses in South Africa. Whether the true *Marasmius sacchari* occurs in South Africa must remain undecided until the fructifications are collected.—*E. M. Doidge.*

210. Weston, William H., Jr. **Philippine downy mildew of maize.** Jour. Agric. Res. 19: 97–122. *Pl. A and B (col.) and 16–25.* 1920.—See Bot. Absts. 6, Entry 260.

211. De Wildeman, E. **À propos du genre Tetracladium. [The genus Tetracladium.]** Compt. Rend. Soc. Biol. Paris 83: 192–194. 1920.—The author insists that this is a true mycelial fungus and that the name should not be suppressed and put among the synonyms of *Asterothrix.* The fungus is widely distributed in northern Europe and is pathogenic, apparently to hyacinth, and other plants.—*E. A. Bessey.*

212. Yasuda, Atsushi. **Eine neue Art von Pterula. [A new species of Pterula.]** Bot. Mag. Tokyo 34: 15–16. 1920.—Describes as new, *Pterula fusispora,* from Fukoji mountain, Kasei-gori, Prov. Harima, Japan.—*Roxana Stinchfield Ferris.*

# PATHOLOGY

G. H. Coons, *Editor*
C. W. Bennett, *Assistant Editor*

213. Anonymous. **Disposiciones vigentes sobre el servicio de sanidad vegetal. [Regulations in force relating to the plant sanitation service.]** Ofic. Sanidad Veg. Sec. Agric. Com. y Trab. [Cuba] *32 p.* 1919.—This publication contains all quarantine and other regulations in force in Cuba for the control of injurious insects and plant diseases. An appendix gives a number of regulations enacted by other countries, which are applicable to plant products of Cuban origin.—*S. C. Bruner.*

214. Arango, Rodolfo. **Algunas plagas de nuestros cultivos. [Some pests of our cultivated crops.** Ofic. Sanidad Veg. Sec. Agric. Com. y Trab. [Cuba] Bol. 2. *94 p., 23 pl., 20 fig., 1 map.* 1919.—A popular treatise on some of the more common plant diseases and insect pests occurring in Cuba. The diseases considered are the bud-rot of the coconut (attributed to *Bacillus coli communis*), the Panama disease of bananas (due to *Fusarium cubense*), and gummosis of the orange (the more common form of which is caused by a species of *Phytophthora*). The closing chapters are devoted to spraying operations and notes on tree surgery.—*S. C. Bruner.*

215. Ball, E. D., and F. A. Fenton. **What per cent of tipburn is caused by the potato leafhopper?** Jour. Econ. Entomol. 13: 218–221. *Pl. 2.* 1920.—Continuation of hopperburn studies (Bot. Absts. 3, Entry 387). A number of fields of potatoes about Ames, Iowa, were kept under continuous observation during the entire season. No evidence of "tipburn" was found in the field until after the nymph generation developed from the over-wintering leaf-hopper. The amount of burning was found to be proportional to the number of leaf-hoppers on the particular leaves. In fields where there were no leaf-hoppers "tipburn" did not appear.—The author gives results of studies with the use of cages to exclude and to include leaf-hoppers.—*A. B. Massey.*

216. Belgrave, W. N. C. **A wet rot of Para rubber roots.** Dept. Agric. Federated Malay States Bull. 28. *21 p. 9 pl.* 1919.—Symptoms of this disease are a wet rotting of diseased wood, the fungus rapidly entering the heartwood and advancing fastest there; collapse and decay of the inner bark; the frequent presence of a tough skin-like dark, brownish red mycelium mass intimately bound up with the outer bark layers; the absence of obvious mycelial strands, the presence of small, powdery-looking, yellow pustules; the presence of brown lines in the wood; the presence of discoloured, light brown areas in the wood. The spread of the fungus is by contact of roots with diseased material. Fructifications are rare. Originally determined as *Poria hypolateritia* (Berk), since found to be *Poria pseudoferreus* Wak. As the fungus so rarely fruits, "clean-clearing" an estate is a practical preventative.—*T. F. Chipp.*

217. Belgrave, W. N. C. **Notes on mycology during 1918.** Agric. Bull. Federated Malay States 7: 141–143. 1919.—The diseases of Para rubber examined in Malaya during 1918 are discussed.

218. Beumee, C. G. B. **Over Bastverwondigen aan den djati. [Bark wounds of teak.]** Mededeel. Proefsta. Boschw. Dept. Landb. Nijverheid en Handel Nederlandsch-Indië 4: 31–54. *Pl. 12–17.* 1919.—An introductory discussion is given of the tissues which take part in wound healing. Among the causes of injuries which are not followed by regeneration of the affected tissues are: (1) Fires in teak woods,—these are usually ground fires rather than crown fires. (2) Theft of bark,—buffalo herders take strips of bark to use for cord or rope. An illustration is given of a tree from both sides of which strips of bark had been taken, with the result that the intervening wood had entirely rotted away. (3) Felling wounds produced by felled trees falling against those which remain standing. Injuries are also described due

to bending by strong wind, quickly followed by the regeneration of the injured tissue. Tension on the windward side of the trunk results in square breaks in the bark, accompanied by vertical slits and the separation of a strip of bark from the wood. The cambium produces new bark under this old loose layer, which later falls off. In one case new tissue was also formed on the inner surface of the loosened bark. False annual rings ascribed to wind bending are illustrated by photographs.—*F. Cramer.*

219. Bigelow, W. D. **Heat penetration in canned foods.** [Abstract.] Absts. Bact. **4:** 11. 1920.—A pyrometer was described adapted to use in commercial canning plants in determining the temperature of the center of sealed cans. Heating curves were shown giving the relative heat penetration of typical foods and illustrating the influence of consistency of the product, initial temperature, and size of cans, on heat penetration. The use of rotating sterilizing machines was also discussed and the influence of different speeds of rotation of the can on the heat penetration was shown by means of appropriate curves. [Author's abst. of paper read before Soc. Amer. Bact.]

220. Brandès, E. W. **Artificial and insect transmission of sugar-cane mosaic.** Jour. Agric. Res. **19:** 131–138. 1920.—Mosaic disease of sugar-cane was communicated to healthy plants in greenhouses near Washington by hypodermic injections, at growing points, of expressed juice from diseased plants.—*Aphis maidis* also proved to be a carrier of the virus. Seed transmission is not definitely established.—*D. Reddick.*

221. Chipp, T. F. **A host index of fungi of the Malay Peninsula.** Gardens' Bull. Straits Settlements **2:** 231–238. 1920.—An alphabetical index of hosts, with all fungi hitherto recorded for them in Malaya.—*T. F. Chipp.*

222. Chipp, T. F. **The fungus flora of Hevea brasiliensis.** Gardens' Bull. Straits Settlements **2:** 186–192. 1920.—An enumeration of all fungi recorded in Malaya for the Para rubber tree; 67 species are mentioned.—*T. F. Chipp.*

223. Clinton, G. P. **Inspection of phaenogamic herbaria for rusts on Ribes sp.** Connecticut [New Haven] Agric. Exp. Sta. Bull. **214:** 423–427. 1916–1917.—Specimens of *Ribes*, including *Grossularia*, from 8 eastern and 3 western herbaria were examined. No light was thrown on the early occurrence of *Cronortium ribicola*, but information was obtained on distribution of three other rusts in U. S. A. These are *Aecidium Grossulariae, Coleosporium ribicola* and *Puccinia Ribes*. The distribution of each is given.—*Henry Dorsey.*

224. Clinton, G. P., and L. F. Harvey. **Co-operative potato spraying in 1917.** Connecticut [New Haven] Agric. Exp. Sta. Bull. **214:** 411–420. 1917.—These were potato-spraying experiments in which 4-4-50 Bordeaux mixture was applied. Hot weather on three days the last of July and the first of August prematurely killed the vines in August in two fields and injured them in two more fields. Trampling the vines in one field caused positive injury before there was time for effect of spraying to show.—Two fields were benefited about enough to pay expenses. In a fourth field there was an increase of 18 bushels. In the fifth field the increase due to spraying was 95 bushels, which was very much in excess of cost.—*Henry Dorsey.*

225. Clinton, G. P., and Florence A. McCormick. **Infection experiments of Pinus strobus with Cronartium ribicola.** Connecticut [New Haven] Agric. Exp. Sta. Bull. **214:** 428–459. *Pl. 37–43.* 1916–1918.—The history of the introduction of the disease into the state is given. Various attempts to infect stems, buds and leaves are described, the inoculations being made with plants in Petri dishes, in greenhouses, under tents and in the open. One-, two-, and three-year seedlings were tested.—The results of the inoculations indicate that infection occurs from late summer to late fall through the leaves only. Inconspicuous, yellowish spots are produced at the point of infection. These become apparent in the following early summer. Later there is invasion of the stem causing slight swelling and discoloration.

Pycnia may develop. Swelling of the stem proceeds in the third year, with pycnial development during the summer. If pycnia were formed the previous year, aecial formation occurs in the spring.—*Henry Dorsey.*

226. Coons, G. H. **Botanical Department notes.** Michigan Agric. Exp. Sta. Quart. Bull. 2:70–75. *Fig. 3–6.* 1919.—Brief popular notes on winter handling of potatoes, Jonathan fruit spot and bitter pit of apple. Progress of barberry campaign is shown by tables.—*E. A. Bessey.*

227. De Wildeman, E. **À propos du genre Tetracladium. [The genus Tetracladium.]** Compt. Rend. Soc. Biol. Paris 83: 192–194. 1920.—See Bot. Absts. 6, Entry 211.

228. Dickson, James G., and Helen Johann. **Production of conidia in Gibberella saubinetii.** Jour. Agric. Res. 19: 235–237. *1 fig.* 1920.—Repeated and abundant crops of conidia may be produced in short periods of time from ascospores, sporodochia conidia, vegetative conidia, or mycelium, when favorable moisture and temperature conditions obtain. This ability of the wheat-scab organism, to produce an abundance of virulent spores in short periods of time, has an important bearing on epiphytotics.—*D. Reddick.*

229. Doidge, Ethel M. **The eradication of citrus canker.** Jour. Dept. Agric. Union of South Africa 1: 124–134. 1920.—This is a tabular statement of the progress of the campaign for the eradication of citrus canker. There are now only three farms in the Rustenburg and Pretoria districts on which it is expected that canker may recur.—*E. M. Doidge.*

230. Elliott, Charlotte. **Halo-blight of oats.** Jour. Agric. Res. 19: 139–172. *Pl. C (col.) and 26–35.* 1920.—Disease is practically confined to oats (*Avena*) but has been found on rye (*Secale*) and was produced artificially on wheat (*Triticum*) and barley (*Hordeum*). Disease appears under conditions unfavorable for growth of host. "Only under particularly favorable weather conditions does the blight develop sufficiently to attract attention or to do serious damage."—Typical lesions are 0.5 to 2 cm. in diameter and are characterized by halo-like margins of chlorotic tissue about a center of dead tissue. A white organism *Bact. coronafaciens*, n. sp., is responsible for the disease. The organism is described and cultural characters presented in detail. Group number, 221.2323023.—A variant strain is described briefly. A yellow motile rod, found commonly on oats, is described, without name, and its cultural characters presented; group number, 221.3333533; non-pathogenic to oats.—*Bact. coronafaciens* persists on seed. Formaldehyde treatment (1:320) "as for smut" does not entirely control the disease and hot-air treatment for 30 hours at 100° is not effective.—The organism is practically confined to the center of the lesion and the halo is probably caused by a diffusible substance, perhaps ammonia.—An extended discussion of and comparison with other bacterial diseases of cereals is included. [See Bot. Absts. 1, Entry 610.]—*D. Reddick.*

231. Elliott, John A. **Field diseases of sweet potatoes in Arkansas.** Arkansas Agric. Exp. Sta. Ext. Circ. 90: 20–28. *Pl. 1–2.* 1920.

232. Federal Horticultural Board, U. S. Dept. Agric. **Quarantine on account of the European corn borer and other dangerous insects and plant diseases. Notice of quarantine No. 41, with regulations.** Serv. and Reg. Announcem. 67. *P. 27–28.* 1920. [Also issued as unnumbered pamphlet from Office of Secretary of Agriculture.]—Of the following plants no stalks or other parts, whether used for packing or for other purposes, in the raw or unmanufactured state are permitted entry into U. S. A.: maize (*Zea mays*), broom corn (*Andropogon sorghum* var. *technicus*), sweet sorghums and grain sorghums (*A. sorghum*), sudan grass (*A. sorghum sudanensis*), Johnson grass (*A. halepensis*), sugar cane (*Saccharum officinarum*), pearl millet (*Pennisetum glaucum*), napier grass (*P. purpureum*), teosinte (*Euchlaena luxurians*), and Job's tears (*Coix lachryma-jobi*). Exceptions are sorghum hay from Canada and clean shelled or threshed grain. Permission may be secured to import broom corn but disinfection is a condition of entry.—*D. Reddick.*

233. Federal Horticultural Board, U. S. Dept. Agric. **Quarantine against corn or maize from Mexico. Notice of quarantine, No. 42, with regulations.** Serv. and Reg. Announcem. 67. *P. 15–17.* 1920. [Also issued as unnumbered pamphlet from Office of the Secretary of Agriculture.]—Maize (grain) from Mexico is prohibited entry into U. S. A. except under regulations, which are stated, and which are designed to prevent introduction of pink bollworm of cotton with it.—*D. Reddick.*

234. Federal Horticultural Board, U. S. Dept. Agric. **Stocks, cuttings, scions and buds of fruits quarantine. Notice of quarantine No. 44.** Serv. and Reg. Announcem. 67. *P. 33–34.* 1920. [Also issued as unnumbered pamphlet from Office of Secretary of Agriculture.]—Vegetative parts of fruits generally are prohibited entry into the United States from Asia, Japan, Philippine Islands, and Oceania, including Australia and New Zealand. The following diseases are mentioned specifically: Japanese apple cankers (*Valsa mali* and *Diaporthe mali*), blister blight (*Taphrina piri*), and rusts (*Gymnosporangium koreaense* and *G. photiniae*).—*D. Reddick.*

235. Federal Horticultural Board, U. S. Dept. Agric. **Sterile packing material for packing of bulbs authorized.** Serv. and Reg. Announcem. 67. *P. 34–35.* 1920.—Plant quarantine 37, making "freedom from soil, etc." a condition of entry into the United States, is amended to allow the use of subsoil from Japan, dune sand from Holland, coral sand from Bermuda, and ground peat. Official certificates must be used. Such materials are deemed sterile so far as diseases and insects are concerned.—*D. Reddick.*

236. Fulton, H. R. **Decline of Pseudomonas citri in the soil.** Jour. Agric. Res. 19: 207–234. 1920.—Tests on many types of soil, including representative ones from the citrus regions, show a very rapid decline of *P. citri* in all, reaching the vanishing point in 14 days. This decline is retarded slightly by rendering the soil slightly alkaline with lime water, by lowering its temperature, and more decidedly by withholding water or by previous sterilization with steam. The organism persists in limited numbers for over a year in air dry soil but disappears promptly on the addition of water. The decline, on the other hand, is hastened by the addition of dilute sulfuric acid or by a moderate increase in temperature. It is more rapid in water than in soil but is prolonged decidedly in sterilized water. The organism easily penetrates the soil to depths of ordinary cultivation but the normal decline seems to occur at such depths.—Certain bacteria found commonly in soils have a marked inhibiting effect on *P. citri* in culture and probably are concerned with its decline in soil.—Young roots of grapefruit seedlings are not readily infected except through wounds.—Rigid experimental methods for making the determinations were developed and tested. They are described in detail.—*D. Reddick.*

237. Gochenour, W. S., and Hubert Bunyea. **The filtration of colloidal substances through bacteria-retaining filters.** [Abstract.] Absts. Bact. 4: 2. 1920.—"The technic involved in the filtration of raw meat juice is: The meat juice is first cleared of coarser particles by centrifugalization, and is then mixed with a small amount of kieselguhr and again centrifugalized. The supernatant fluid is drawn off, mixed with a sufficient amount of kieselguhr to make a paste approximating the consistency of a thin gruel, and poured directly over the filter candle. Best results are obtained by using a minimum amount of vacuum. It is therefore helpful to place the filter candle upright in a mantle, allowing gravitation to minimize the amount of vacuum necessary to draw the material through the filter candle into the vacuum flask. The filtration process should immediately follow centrifugalization. The finally filtered product is capable of complete coagulation. Milk, hemolized erythrocytes and other colloids can be rapidly filtered by this process." [From authors' absts. of paper read before Soc. Amer. Bact.]—*D. Reddick.*

238. Hartwell, Burt L. **Thirty-first annual report of the Director of the Rhode Island Agricultural Experiment Station.** Bull. Rhode Island State Coll. 14: 57–65. 1919.—See Bot. Absts. 6, Entry 15.

239. Hartwell, Burt L., and S. C. Damon. **A field comparison of hydrated lime with limestone of different degrees of fineness.** Rhode Island Agric. Exp. Sta. Bull. 180. *18 p.* 1919.—See Bot. Absts. 6, Entry 16.

240. Hartwell, Burt L., F. R. Pember, and G. E. Merkle. **The influence of crop plants on those which follow. II.** Rhode Island Agric. Exp. Sta. Bull. 176. *47 p.* 1919.—See Bot. Absts 6, Entry 18.

241. Johnston, J. R. **La enfermedad "mosaico" de la caña de azucar. [The mosaic disease of sugar cane.]** Ofic. Sanidad Veg. Sec. Agric. Com. y Trab. [Cuba] Circ. 6. *11 p., 3 pl. (colored), 2 fig.* 1919.—The author gives a description of the disease together with a brief discussion of its cause, the damage occasioned, varieties of cane attacked, control, and known distribution in Cuba and other countries. The following recommendations are made: (1) That only carefully selected healthy seed be used. (2) On buying seed cane from a distant locality, obtain a certificate from the Office of Plant Sanitation, which guarantees the said cane to be free from infection. (3) Any person desiring to obtain cane for seed from a foreign country for experimental purposes, should request this through mediation of the Department of Agriculture, Commerce and Labor, in accordance with the decree of the Secretary of Agriculture dated July 16, 1919. This decree prohibits the importation of sugar cane from all countries, except that consigned to the Department of Agriculture and intended for experimental purposes, as well as the transportation within the national territory of cane from infected zones to other localities.—*S. C. Bruner.*

242. Koch, L. **Uitkomsten van een proef met het gebruik van "gedegenereerde" cassavebibit. [Results of a trial with the use of degenerated cassava cuttings.]** Korte Ber. Selectie-en Zaadtuinen voor Rijst en andere eenjarige Inlandsche Landbouwgew., Dept. Landb. Nijverheid en Handel [Buitenzorg] 12: 1–5. Feb., 1919.—Varieties of cassava imported into East Java from West Java (with moist climate) were reported to degenerate and a trial was made at the Plant Breeding Station for Annual Crops at Buitenzorg to compare the value for propagation of these totally degenerated cuttings with cuttings of the same variety that had been grown for more than ten years at Buitenzorg. Although the cuttings were made from a degenerated crop no difference at all was found between the yields of the degenerated and the normal cassava. The degeneration may result in very low yields. The following percentages indicate the approximate yield of cuttings of several "generations:"—Import, 100; 1st generation, 80; 2nd gen., 65; 3rd gen., 50; 4th gen., 37; 5th gen., 35. In some cases the percentage for the 5th generation was only 20–30.—*L. Koch.*

243. Kornauth K., and A. Wöber. **Versuche zur Bekämpfung des roten Brenners und des echten Mehltaues der Reben im Jahre 1917. [Investigations on control of grape diseases caused by Pseudopeziza tracheiphila and Oidium.]** Zeitschr. landw. Versuchsw. Österr. 21: 295–312. 1918.—(1) Red leafburn. Treatments made in the spring and at "regular intervals." Bordeaux mixture (1.5 per cent) gave best results. "Bosnapasta" (1.5 per cent) gave nearly as good results. Peroxide (3 per cent) was not so good and lime-sulfur solution (2 per cent by volume) was worthless. Sulfur combined with Bordeaux mixture added nothing. (2) Downy mildew. Soda solution and "antifungin" injured the foliage. Gray sulfur (trade name, "Kreide") gave the most slight odor and taste of tar oil but this disappeared in fermentation; in this respect "melior" and calcium sulfid were worse. Potassium-permanganate-lime mixture gave satisfactory control but sodium thiosulfate proved worthless, as did limesulfur solution, "antifungin" and soda solution. [Through abst. by Matouschek in: Zeitschr. Pflanzenkr. 29: 262. 1919 (1920).]—*D. Reddick.*

244. Labrie, L'abbé. **Curueux cas d'implantation de cuscute au sommet d'un arbre. [Curious case of implantation of Cuscuta to the top of a tree.]** Actes. Soc. Linn. Bordeaux (Proces-verbaux) 69: 57–60. 1915–16.—*Cuscuta minor* D.C., which is usually parasitic on clover, sedges, and grasses, was in one instance found in the top of *Viburnum tinus* L., three meters from the ground.—*W. H. Emig.*

245. Lee, H. Atherton. **Behavior of the citrus-canker organism in the soil.** Jour. Agric. Res. 19: 189–205. *Pl. 36–37.* 1920.—*Pseudomonas citri* multiplies in sterilized soil but in competition with the usual soil organisms in tubes or boxes commonly does not persist for more than 6 days. Its survival is even shorter in the soil of the orchard.—Cankers were produced in mature wood and in roots of citrus. The organism may persist for a long time in cankers on roots, buried wood and leaves.—*D. Reddick.*

246. Mitchell, D. T. **Poisoning of cattle by feeding on old mealie lands.** Jour. Dept. Agric. Union of South Africa 1: 138–143. 1920.—The feeding of oxen with cobs infected with *Diplodia zeae* produced in experimental animals a condition which was indistinguishable from that occurring in animals which gained access to old mealie lands, and a similar condition could be set up by feeding on a culture of *Diplodia zeae* grown on sterile maize. The intensity of the symptoms and the mortality depend upon the quantity fed and on the percentage of infection present in the grain. Cultures of allied species of fungi grown on maize are incapable of setting up similar clinical symptoms. The causal factor is not the fungus itself, but must be looked for in the material which is formed as a result of the interaction of *Diplodia zeae*, during its development, with the starchy content of the maize grains.—*E. M. Doidge.*

247. Newell, Wilmon. **Citrus canker eradication. Report of the Plant Commissioner for the biennium ending April 30, 1918.** Florida State Plant Bd. Quart. Bull. 3: 36–44. 1919. —An account is given of citrus-canker (*Pseudomonas citri*) eradication work during 1917 and 1918, with tables and charts showing the scope, progress and expenditures of the work.—*C. D. Sherbakoff.*

248. Newell, Wilmon. **Report of the Plant Commissioner for the biennium ending April 30, 1918.** Florida State Plant Bd. Quart. Bull. 3: 82–85. 1919.—A brief report on the work of R. A. Jehle with citrus canker (*Pseudomonas citri*) at Redland, Dade County, Florida. In this work, by inoculation experiment, it was found that of many hosts tried only "wild lime" (*Zanthoxylum fagara*) is susceptible to the disease. The work showed also that of the many methods suggested by various parties for citrus-canker control none but prompt and complete destruction of the infected trees, coupled with rigid disinfecting measures, is of any value.—*C. D. Sherbakoff.*

249. Peglion, Vittorio. **Intorno al comportamento di alcune varietà di frumento rispetto alla carie. [Behavior of wheat varieties with respect to bunt.]** Atti. R. Accad. Lincei [Roma] Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^2$: 398–400. 1919.—Fields of wheat in some localities were found affected with *Tilletia caries* (D.C.) Tul., others with *T. laevis* Kühn and others with both. In infection tests with different wheat varieties, the percentage of spikes affected varied from 33.6 per cent (Cologna variety) to 74.1 per cent (Romanello variety).—*F. M. Blodgett.*

250. Pole-Evans, I. B. **Report on cold storage conditions for export fruit at Capetown.** Union of South Africa Dept. Agric. Ann. Rept. 1918: 1–8. *8 fig.* 1919.—This is a report on the occurrence of *Penicillium expansum*, *P. digitatum*, and *P. italicum* in cold storage chambers at Capetown and on steam-boats.—*E. M. Doidge.*

251. Putterill, V. A. **A new apple tree canker.** South African Jour. Sci. 16: 256–271. *Pl. 21–30. 6 fig.* 1919.—A fungus belonging to the genus *Botryosphaeria* has been found to be the cause of a rather serious canker of apple trees at the Vereeniging Estates. An account is given of its morphology and its salient cultural characters, and of a number of inoculation experiments which were carried out. The characters of the fungus are compared with those of *Physalospora cydoniae*, the cause of the New York apple-tree canker from which it is considered to be distinct. The fungus is described as a new species, *Botryosphaeria mali* Putterill.—*E. M. Doidge.*

252. Roberts, Herbert F. **Yellow-berry in hard winter wheat.** Jour. Agric. Res. 18: 155–169. 1919.—See Bot. Absts. 6, Entry 32.

253. Sanders, J. G., and D. M. DeLong. **Dust versus spray for control of some cherry pests in Pennsylvania.** Jour. Econ. Entomol. 13: 208-210. 1920.—Pests under consideration were curculio, slug and leaf spot. Materials used were sulphur-arsenate-of-lead dust (90-10), lime-sulphur spray (1-40), lime-sulphur-arsenate-of-lead dust (50-45-5), Bordeaux spray (3-3-50 to 1 pound arsenate of lead). Short discussions with results are given.—*A. B. Massey.*

254. Spragg, F. A., and E. E. Down. **Rust resisting sunflowers.** Michigan Agric. Exp. Sta. Quart. Bull. 2: 128-129. *1 fig.* 1920.—Of four varieties of sunflower (*Helianthus annuus*) cultivated in 1918 for a variety test, a South American variety, Kaeurpher, was nearly rust-resistant, the other three being killed before the close of the season.—*E. A. Bessey.*

255. Stevens, H. E. **The potato wart disease.** Florida State Plant Bd. Quart. Bull. 3: 116-120. 1919.

256. Stirling, Frank. **Citrus canker eradication.** Florida State Plant Bd. Quart Bull. 3: 122-123, 134-135. 1919. *Ibid.* 4: 14-15, 35-36. 1920.—Tabular statement of progress of the work of eradicating citrus canker (*Pseudomonas citri*).—*C. D. Sherbakoff.*

257. Strampelli, Nazareno. **Esperienze intorno alla carie (Tilletia Caries) del frumento. [Experiments with stinking smut in wheat.]** Atti R. Accad. Lincei [Roma) Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^2$: 151-153. 1919.—Having noticed that different varieties of wheat were differently affected by stinking smut, the author tested the susceptibility of a number of varieties by planting the seed in furrows thoroughly sprinkled with smut spores. The percentage of healthy plants in the different varieties ranged from 0 to 45. The influence of the position of the spores in the soil with relation to the wheat seed was also tested. Only when the spores were in the same soil layer with the wheat did any considerable infection occur.—*F. M. Blodgett.*

258. Traverso, G. B. **Gelate tardive ed infezione di rogna degli olivi nel 1919. [Late frosts and infection of olives by scab in 1919.]** Staz. Sper. Agr. Ital. 52: 463-484. *Fig. 1-7.* 1919.—The author describes the condition of olive plantings of various ages and in various localities in Italy, after a season characterized by late frosts. The organism responsible for the diseased condition is the well-known *Bacillus oleae* (*B. savastanoi*), but the extremely severe attacks of the season must be ascribed to the effects of freezing in affording avenues of entrance. The author recommends heavy pruning and treatment with Lotrionte's ferro-calcic mixture (ferrous sulphate 5 kgm., hydrated lime 10 kgm., water 100 l.). Bordeaux mixture with the addition of some disinfecting substance such as lysoform, phenol or formalin (1.5-2 per cent) is also recommended.—*A. Bonazzi.*

259. Van der Bijl, Paul A. **Preliminary studies on some fungi and bacteria responsible for the deterioration of South African sugars.** Union of South Africa Dept. Agric. Sci. Bull. 12: 1-32. *Fig. 1-14.* 1920.—A brief characterization is given of fungi isolated from sugar samples; all are able to invert sucrose to some extent, and with one exception grew in solutions of 63 Brix concentrations. The resistance of the fungi to disinfectants was also tested. A similar series of experiments was also carried out with a number of bacteria isolated from sugar samples. The ability of these organisms to grow on sugar is largely dependent on the moisture content and temperature of the store-houses and mills. Formalin, chloride of lime and milk of lime appear to be the most suitable disinfectants.—*E. M. Doidge.*

260. Weston, William H., Jr. **Philippine downy mildew of maize.** Jour. Agric. Res. 19: 97-122. *Pl. A and B (col.) and 16-25.* 1920.—Disease is prevalent and often very destructive throughout Philippine Islands. Teosinte (*Euchlaena luxurians*) and sorghum (*Andropogon*) as well as maize (*Zea*) are affected, but sorghum is highly resistant. Native, wild grasses have not been found affected —"Symptoms of the disease may appear from the time the plants are seedlings with three or four leaves to the time the tassels and silk are developed. In general, infected plants show a yellowing of the leaves in more or less restricted striped areas, a

whitish down of conidiophores, principally on the leaves, abnormalities in growth of the vegetative parts, and abortive development of the ear, resulting in partial or complete sterility. These effects of the disease are described and illustrated."—The disease is caused by *Sclerospora philippinensis* n. sp. which is fully described and illustrated. *S. maydis* of Reinking is a synonym. Oospores have not been observed. The fungus is compared critically with other oriental *Sclerosporas*.—Conidia are produced abundantly at night; they germinate promptly by production of a tube and at temperatures between 6.5° and 25°. Desiccated conidia lose their vitality.—An undescribed species of *Sclerospora*, producing only oospores, has been found on *Saccharum spontaneum*, a common wild grass.—*D. Reddick.*

261. Winslow, C.-E. A., and I. S. Falk. **A contribution to the mechanism of disinfection.** [Abstract.] Absts. Bact. 4: 2. 1920.—"The view of Chick and other earlier workers that the rate of dying of bacteria follows the orderly course of a monomolecular reaction has recently been challenged by Brooks, who shows that in the case of hemolysis of blood cells and inferentially in the case of bacterial death, the logarithmic values corresponding to the number of surviving cells do not lie on a straight line. He concludes that the shape of the curve is dependent essentially upon two independent variables; (1) the velocity at which the physicochemical changes are going on in the protoplasm of the cells; and (2) the variations in resistance of the individual cells to the toxic substances present.—From somewhat exhaustive studies of the rate of mortality of colon bacilli in water and salt solutions we are able to confirm Brooks' conclusion as to the shape of the curve, since we find the rate of reduction is sufficiently slow to permit of careful observation we do obtain an inflected curve rather than a straight line.—We believe, however, that these results can be explained more simply without Brooks' postulate of a specific factor, by the following assumptions:—That the death of a cell is due to a reaction $A \rightarrow M$ and a reaction $M \rightarrow B$. Each of these reactions is of a monomolecular order (and there are probably many more than two; but two will serve for our argument). The velocity of the second reaction at any time is dependent upon the concentration of M, and hence, is dependent upon the velocity of the first reaction. Disinfectants and toxic substances accelerate one or the other of these reactions, and hence lead more rapidly to death. Differences in the ages of the individual cells, we may consider, are accompanied by differences in the concentration of one or the other substance,—and these differences determine the velocity of the toxic reaction. Since the velocity of a reaction is always dependent upon the concentration of reacting substances, such variations from monomolecular reaction curves as have been observed in studies of disinfection, hemolysis, and other processes are easily explained quantitatively by the assumption of two, dependent, monomolecular reactions; of different rate; and exactly such curves are figured by Mellor in his 'Chemical Dynamics and Statics.'"—[Authors' abst. of paper read before Soc. Amer. Bact.]

262. Wöber, A. **Versuche zur Bekämpfung des roten Brenners der Reben im Jahre 1918. [Investigations in the control of red leaf burn of grape in 1918.]** Allgem. Weinzeitg. 36: 9–10. 1918.—Reports use of a number of proprietary compounds for control of leaf burn, caused by *Pseudopeziza tracheiphila*, in Austria. Winter treatment with 40 per cent ferrous sulfate gives better results than the use of 10 per cent sulfuric acid, but winter treatment must be supplemented with summer spraying.—Of the various standard and proprietary mixtures tested Bordeaux mixture and "Bosna" were best. [Through abst. by Matouschek in: Zeitschr. Pflanzenkr. 29: 263. 1919 (1920).]—*D. Reddick.*

263. Wolff, W. H. **Influence of the prevention of leaf blight on the growth of nursery cherries and pears.** Amer. Nurseryman 31[6]: 110. 1920.

# PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

264. Bardie, A. **Quelques notes sur la Physalis Alkekengi dans la Gironde. [Notes concerning Physalis Alkekengi L.]** Actes Soc. Linn. Bordeaux (Proces-verbaux) 69: 39–47. 1915–16. (Received May, 1920.)

265. Cauda, A. **L'essenza di senape nei vegetali. [The mustard-oil content of plants.]** Staz. Sper. Agr. Ital. 52: 544–548. 1919.—The physiological function of allylisothiocyanate is not as yet known, but indications are that the content of a plant in this compound is not only characteristic of the species but much dependent on the environment. The close relation of the mustard oil and the cyanic acid group is indicative of the great importance these compounds play in the physiology of plants. According to Gola the more sterile the environment, the greater the content of cyanic acid, and to this may be added that the more sterile the environment the greater the content of mustard oil. If to all the plants known to contain cyanic acid were to be added all those known to contain mustard oil, the following list would be compiled: the *Sinapis*, *Cheiranthus Cheirei* L., *Lepidium Draba* L., *Brassica napus* L., *Raphanus sativus* L., *Raphanus raphanistrum* L., *Sisymbrium alliaria*, *Nasturtium officinale* L., *Lepidium sativum*, *Cochlearia armoracia*, *Reseda lutea* L., *Reseda luteola* L., *Capparis spinosa*, various species of *Acacia*, *Thlaspi arvense*, *Asparagus officinale* and various species of *Erysimum*. Analysis of seeds of several among these genera led the author to conclude that the plants grown in southern climates gave seeds having a smaller percentage of oil than seeds from plants grown in more northern localities. This, he assumes, indicates incomplete transformation of albuminoids which are then not assimilated completely in those places where the vegetation of the plant is not fully accomplished. Seeds from plants growing wild in the north of Italy had a higher mustard-oil content than seeds from plants cultivated in Sicily; cultivation seems therefore to diminish the mustard-oil content of the plants, although the seeds from these same southern plants under cultivation have a greater fat content. In seeds and sections of plants the author could find specialized cells (such as were pointed out by Guignard) within which there was a localization of myrosin which acts on potassium myrosinate with the formation of the isothiocyanate of allyl according to the following equation: $C_{10}H_{16}NKS_2O_9 + H_2O = C_6H_{12}O_6 + C_3H_5NCS + HKSO_4$. The number and size of these cells tends to diminish in etiolated leaves. Seeds of *Sinapis nigra* contained 0.294 per cent of mustard oil, while green seedlings (air dry) contained 0.280 per cent, and air dry etiolated seedlings contained 0.170 per cent. A method is described for the determination of the mustard-oil content by oxydation with bromine water and the weighing of the sulphate radical as barium sulphate. The apparatus used is also described.—*A. Bonazzi.*

266. Chodat, R. **Études faites au jardin alpin de la "Linnaea." I. Sur quelques faits de botanique et de geographie economique a Bourg-Saint Pierre. [Observations made at the alpine garden of Linnaeus. I. Concerning certain things of economic value related to botany and geography at Bourg-Saint Pierre.]** Bull. Soc. Bot. Genève 11: 30–41. 1919.—See Bot. Absts. 6, Entry 9.

267. Fuller, H. C. **Report on alkaloids.** Jour. Assoc. Official Agric. Chem. 3: 379. 1920.—Report of progress on atropin and strychnin determination.—*F. M. Schertz.*

268. Haslett, J. P. **Plants used as ingredients in the manufacture of country spirits in Southal Pargavas.** Indian Forester 45: 530–531. 1919.—Twenty-five species of native Indian plants are given from which spirits are made from the roots and two in which the bark is used. —*E. N. Munns.*

269. Jamieson, George S., and Walter F. Baughman. **The chemical composition of cottonseed oil.** Jour. Amer. Chem. Soc. 42: 1197-1204. 1920.

270. Linsbauer, L. **Zur Bekämpfung der Kohlweisslinge. [Combating the white cabbage-butterfly.]** Naturw. Zeitschr. Forst- u. Landw. 17: 147–149. 1919.—French war-prisoners in Germany, and gardeners in various localities, have been in the habit of sticking branches of the common black elder (*Sambucus racemosa*) in the ground between cabbage rows to protect them against the white cabbage-butterfly. The author successfully tried the same experiment. It has also been occasionally found that hemp planted with cabbage acts as a protection against the same butterfly. The effect of hemp is ascribed to odors emitted by the plant glands; but how elder acts is not known. An effort by the author to spray the cabbage with a solution obtained by boiling green leaves of black elder proved unsuccessful.—*J. Roeser.*

271. May, W. L. **Whorled milkweed, the worst stock-poisoning plant in Colorado.** Colorado Agric. Exp. Sta. Bull. 255. *39 p., 28 fig.* 1920.—Whorled milkweed (*Asclepias galioides*) has been shown to be responsible for heavy losses of sheep, cattle, and horses in western and southwestern Colorado. A detailed description of the plant is given, whereby it may be distinguished from two very closely related species, *Asclepias verticillata* and *Asclepias pumila.* The geographical distribution of the weed in Colorado, its habitat, and methods of distribution are discussed, also methods of eradication.—*W. G. Sackett.*

272. Nelson, E. K. **The composition of oil of chenopodium from various sources.** Jour. Amer. Chem. Soc. 42: 1204–1208. 1920.

273. Nord, F. F. **Der Acetaldehyd in der Natur, Ergebnisse des Abfangverfahren. [Acetaldehyde in nature. Methods of isolation.]** Naturwiss. 7: 685–687. 1919.

274. Scurti, F., and C. E. Zay. **Distillazione della lolla di riso con acidi condensati per la preparazione dei solventi dell'acetilcellulosa. [The distillation of rice chaff with concentrated acids for the preparation of acetylcellulose solvents.]** Staz. Sper. Agr. Ital. 52: 278–290. 1919. —In view of the facts that furol, one of the most appropriate solvents of acetylcelluloses, is not easily obtained, and that pentosans yield it under treatment with concentrated acids, according to the formula $C_5H_{10}O_5 = 3H_2O + C_4H_3O.COH$, the authors utilized the large amounts of pentoses in rice chaff. The production and distillation of furol is done in a constant level still in which the ratio chaff: acid: distillate is 1:10:10, when the acid used is 30 per cent $H_2SO_4$ at the start. When three parts of distillate have passed over, the constant level apparatus is stopped and the acid allowed to concentrate to 50 per cent when the distillation is continued. When four more parts of distillate are collected furol formation has ceased but there is an increase in acidity due to the formation of acetic acid, which can be recovered by additional distillation and concentration. Distillation of the dilution thus obtained, in presence of NaOH, with formation of $NaC_2H_3O_2$, and additional distillation of the distillate obtained in presence of NaCl gave the furol in a concentrated solution. The yields obtained were 40 grams furol, 110 grams $NaC_2H_3O_2$ and 650 grams of carbonaceous material, from 1 Kg. of chaff. The $H_2SO_4$, recovered in a concentration of 50 per cent, is well suited to the manufacture of perphosphates. The carbonaceous matter obtained has a calorific value of 3300 (Mahler).—*A. Bonazzi.*

275. Smith, F., and C. T. White. **An interim census of cyanophoric plants in the Queensland flora.** Proc. Roy. Soc. Queensland 30: 84–90. 1918.—Of the plants listed in this paper 13 are grasses, 10 are native ferns and 9 belong to the natural order *Proteaceae. Passiflor-aceae* and *Droseraceae* are also prominently cyanogenetic families. The order *Chenopodiales* has not been previously recorded as containing any cyanophoric plant. Twenty-two plants are recorded for the first time as yielding hydrocyanic acid. Several of the plants recorded are of economic importance in relation to the poisoning of stock.—*J. H. Faull.*

276. Wilson, E. H. **Camphor, Cinnamomum Camphora Nees & Ebermaier.** Jour. Arnold Arboretum 1: 239–242. 1920.—An account of the camphor industry of eastern Asia and particularly that of Formosa is given.—*Alfred Rehder.*

# SOIL SCIENCE

J. J. Skinner, *Editor*
F. M. Schertz, *Assistant Editor*

## ACIDITY AND HYDROGEN-ION CONCENTRATION

277. Blair, A. W., and A. L. Prince. **The lime requirement of soils according to the Veitch method compared with the hydrogen-ion concentration of the soil extract.** Soil Sci. 9: 253–259. *2 fig.* 1920.—Determinations were made of the lime requirement by the Veitch method and of the hydrogen-ion concentration of the soil extract by a colorimetric method, on plots of Sassafras loam to which varying quantities of limestone had been added. The hydrogen-ion concentration of the soil extract decreased with increasing applications of limestone, but not necessarily in proportion to the amount of limestone added. A fairly close correlation exists between the hydrogen-ion concentration of the soil extract and the lime requirement as determined by the Veitch method. Soils having a $P_H$ of 6.7 are alkaline by the Veitch method.—*W. J. Robbins.*

278. Demonlon, A. **The reaction of soils, its determination and practical significance.** Rev. Sci. 58: 173–177. 1920.—Discussion and general review of work on soil acidity.—*R. B. Deemer.*

279. Joffe, Jacob S. **Hydrogen-ion concentration measurements of soils in connection with their "lime-requirements."** Soil Sci. 9: 261–266. *2 fig.* 1920.—The lime requirement of soils showing about the same $P_H$ values is considerably higher for soils high in organic matter than for sandy soils. In using the Veitch method a $P_H$ value of 6.6–6.8 of the solution before evaporation indicates that the end point of the lime requirement by the Veitch method has been reached.—*W. J. Robbins.*

280. Wherry, Edgar T. **The soil reactions of certain rock ferns. I.** Amer. Fern Jour. 10: 15–22. 1920.

281. Veitch, F. P. **Report on the lime requirement of soils.** Jour. Assoc. Official Agric. Chem. 3: 371–374. 1920.—Report of progress.—*F. M. Schertz.*

## INFLUENCE OF BIOLOGICAL AGENTS

282. Brown, P. E., and W. V. Halversen. **Effect of seasonal conditions and soil treatment on bacteria and molds in soil.** Iowa Agric. Exp. Sta. Res. Bull. 56: 251–278. 1919.—This study of the numbers of bacteria and molds in the soils of six differently-treated plots at the Iowa Agric. Exp. Sta. throughout one full year showed that the bacteria decreased in the late fall with lowering temperature, until the soil became frozen, when the number rose and fell with the temperature regardless of the moisture. Upon thawing of the soil, the number decreased but this was followed by an increase with increasing temperature and a maximum number was reached on June 19 for all the cultivated plots and on April 12 for the continuous timothy plot. The maximum counts were obtained on February 12 and June 19 with intervening minimum counts. During the summer and early fall, the bacteria did not develop parallel with either moisture or temperature. Applications of peat depressed the bacteria, manure and clover increased the number, while the continuous timothy plot showed the highest number, which may have been due to the topography of the plot.—The number of molds in the soils varied from one sampling to another, but there was no apparent effect of temperature, moisture, or soil treatment. The actual number of molds ranged from 42,000 to 131,000 per gram of soil, on the average. The number generally amounted to one-fortieth to one-fiftieth of the bacteria present. There was no apparent relation between the bacteria and molds. Three media were used in the work. Albumen agar gave the highest count of bacteria with modified synthetic agar second and Cook's No. 11 third. In the case of the molds, albu-

men agar gave the lowest counts while the other two media gave about the same results.—Active mold growth was shown in normally cultivated soils by the development of mycelia from small portions of soil when inoculated into agar plates. The presence of mold spores in the soil is believed to be important, as it indicates the previous and future development of active mycelia. There is nothing yet to disprove the idea that molds go through a regular life cycle in the soil.—*P. E. Brown.*

283. Gillespie, Louis J. **Reduction potentials of bacterial cultures and of water-logged soils.** Soil Sci. 9: 199–216. *4 fig.* 1920.—A discussion is given of the quantity factor and the intensity factor of oxidation and reduction. Oxidation and reduction potentials are taken as measurements of the intensity factor and the methods used to measure these potentials in bacterial cultures and soils are described. Constant reduction potentials, in value close to the hydrogen-electrode potentials, were secured for the facultative anaerobe *B. coli*, and also for mixed cultures of soil organisms when grown in a deep layer. Measurements of cultures of aerobes showed progressively increasing reduction potentials with lapse of time, but in no case did the reduction potential approach the hydrogen-ion potential as closely as 0.3 volt. This may indicate a general difference between anaerobes and aerobes. Soils treated with excess of water became highly reducing as evidenced by their reduction potentials. At the same time their hydrogen-electrode potentials changed, the soils becoming less acid. The speed with which the soils became highly reducing varied with the soil, but the addition of 0.1 per cent of dextrose favored the development of reducing conditions. "Sourness" of soils includes more than acidity and this residual unfavorable quality may be a high intensity of reduction.—*W. J. Robbins.*

284. Keitt, T. E., and A. W. Murray. **A new method for rendering insoluble phosphates available.** Georgia Agric. Exp. Sta. Bull. 132: 47–58. (1919) 1920.—The work was undertaken to determine the influence of composting commercial organic ammoniates, ground rock phosphate and rich soil, on availability of phosphorus content of ground-rock phosphate and on loss of ammonia from organic ammoniate due to composting. Seven compost heaps were made, cottonseed meal being the source of ammonia. An attempt was made to maintain these heaps at 60 per cent of their maximum water-holding capacity. Heaps were covered to cut down oxygen supply and to reduce the temperature. The tables presented show that part of the phosphoric acid of raw rock-phosphate may be made available by composting with cottonseed meal, some being changed to a water soluble form.—*T. H. McHatton.*

285. Moore, G. T., and J. L. Karrer. **A subterranean algal flora.** Ann. Missouri Bot. Gard. 6: 281–307. 1919.

## FERTILIZATION

286. Bear, F. E. **Adapting fertilizers to soils, farms, crops and climate.** Amer. Fertilizer $52^{12}$: 72h. 1920.

287. Conrey, G. W. **Soils, soil characteristics and their relation to fertilizer requirements.** Amer. Fertilizer 52: 106–114. 1920.

288. Wenholz, H. **Soil improvement for maize. 1. Manures and fertilizers.** Agric. Gaz. New South Wales 31: 318–324. 1920.—Discusses potash and lime and residual effect of fertilizers.—*L. R. Waldron.*

289. Lewis, C. I., F. C. Reimer, and G. G. Brown. **Fertilizers for Oregon orchards.** Oregon Agric. Exp. Sta. Bull. 166. *48 p. 3 fig.* 1920.—See Bot. Absts. 6, Entry 124.

## FERTILIZER RESOURCES

290. Bongiovanni, C. **Utilizzazione delle acque ammoniacali del gas come concime. [The utilization of ammoniacal waters, from the manufacture of gas, as fertilizer.]** Staz. Sper. Agr. Ital. 52: 521–523. 1919.—The description of a method for the preparation of a new fer-

tilizer by intimate contact of mineral superphosphates with ammoniacal waters in flat pans, followed by evaporation. On mixing the two substances elimination of $CO_2$ occurs, interaction of ammonium carbonate and acid phosphate. The acidity of the perphosphate eliminates hydrocyanic acid and cyanides, which are generally contained in the ammoniacal waters. The resulting compound may have, according to the author, the following formula: $Ca(NH_4HPO_4)_2 + Ca((NH_4)_2PO_4)_2$. After drying the material is crushed and finally has the following characters: odorless, non hygroscopic and unalterable, containing 12.58 per cent $P_2O_5$ soluble in citrated water, 3 per cent nitrogen and 12.48 per cent moisture.—*A. Bonazzi.*

291. Dustman, R. B. **Solubility and availability.** Amer. Fertilizer 52[13]: 70–72. 1920.

292. Jenkins, E. H., and E. Monroe Bailey. **Fertilizer report for 1919.** Connecticut [New Haven] Agric. Exp. Sta. Bull. 217: 53–106. 1919.—Analyses of 339 brands of fertilizers offered for sale in the state are given.—*Henry Dorsey.*

293. Proulx, E. G. **Interpretation of guarantees and analysis.** Amer. Fertilizer 52[13]: 72d–72g. 1920.

294. Waguet, P. **A few notes upon chemical fertilizers.** Rev. Prod. Chim. 23: 207–210. 1920.—The world's production of phosphates is shown with a detailed account of the French phosphate resources and methods of preparing ammonium and tetra phosphate. Sources and composition of the world's potash deposits are also given.—*R. B. Deemer.*

## INFLUENCE OF SALTS ON SOLUBILITY

295. McCool, M. M., and Millar, C. E. **Effect of calcium sulphate on the solubility of soils.** Jour. Agric. Res. 19: 47–54. 1920.—Six different soils were treated with a saturated solution of calcium sulfate. The rate of formation of soluble substances was determined by means of the freezing-point method. Whether the soil was used as it occurred in nature or whether soluble substances were first reduced to a minimum by washing with distilled water, the calcium sulfate treatment resulted in an increase in the rate of formation of soluble substances. "It seems that it is possible to alter the composition of the soil solution and that whether such changes will have any effect on plant growth or not or whether the effect will be favorable or unfavorable will depend upon the nature of the soil and of the substances added." —Tenth-normal calcium phosphate used in the same way decreased the rate of formation of soluble substances. When the two are used together the effects of calcium sulfate are counteracted to some extent.—From carbon dioxide determinations, it is concluded that the increase in the rate of formation of soluble substances brought about by treatment with calcium sulfate is due to something other than increased biological activity.—*D. Reddick.*

296. Kearney, Thomas H. **The relative absorption by the soil of sodium carbonate and sodium chloride.** Soil Sci. 9: 267–273. *1 fig.* 1920.—When equal volumes of equal concentrations of sodium carbonate and sodium chloride have been allowed to remain in contact with sand for several hours, the electrical resistance of the same indicates that more sodium carbonate than sodium chloride has been removed from solution. Conclusions that sodium carbonate is less toxic to plants than sodium chloride are due to failure to consider this fact.—*W. J. Robbins.*

297. Spurway, C. H. **The effect of fertilizer salts treatments on the composition of soil extracts.** Michigan Agric. Exp. Sta. Tech. Bull. 45. *18 p.* 1919.

## MISCELLANEOUS

298. Bauer, F. C. **The effect of leaching on the availability of rock phosphate to corn.** Soil Sci. 9: 235–251. *2 pl., 2 fig.* 1920.—Corn was grown in quartz sand in pots to which rock phosphate or acid phosphate and a nutrient solution lacking phosphate were added. Some of the pots were frequently leached with the nutrient solution. Leaching increased the yield

of corn with rock phosphate but decreased it with acid phosphate. Leaching with a nutrient solution containing ammonium nitrate as the source of nitrogen increased the availability of the rock phosphate as measured by the phosphorus content of the plants. With sodium nitrate, this was not noted. The solution containing ammonium nitrate also removed more calcium in the drainage water than did the sodium nitrate. The effect of leaching in increasing the availability of rock phosphate is explained on the basis of the mass law.—*W. J. Robbins.*

299. Gain, Edmond, and André Gain. **Conditions thermiques du sol sous l'influence de la végétation locale.** **[Thermal conditions of the soil under the influence of local vegetation.]** Rev. Gén. Bot. [Paris] 32: 161–164. 1920. A series of measurements showing the degree to which vegetation of various kinds lowers the temperature of the soil at and below the surface. The cooling effect, brought about by the evaporation of water and shading from direct sunlight, varies, in meadows and cultivated fields, from less than 1° to more than 5°.—*L. W. Sharp.*

300. Mosséri, Victor M. **Note sur les dépôts Nilotiques des gazayers et saouahel d'Egypte.** **[Note upon the river deposits upon the islands and the flooded lands along the banks of the Nile in Egypt.]** Bull. Inst. d'Egypte 1: 151–180. 1919.—In accordance with the proportion of sand and clay which they contain, the deposits are classified as ramleh (sandy), safra (silico-argilaceous) and soda (argilaceous). On the first only water melons and other cucurbitous crops and barley are grown; the second produces barley and wheat; while the third for the first year, is either left fallow or is planted to berseem (*Trifolium alexandrinum*), which is sown in the mud without preparation; afterwards, it may produce any kind of crop. The *ramleh* and *safra* soils, being very permeable, give up their water very readily as the level of water recedes from the surface at the time of the low Nile. The *soda* (or clay) soils, on the other hand, hold the water much longer. However, when freshly deposited in thick layers it is almost impossible to prepare or cultivate them. In drying they crack enormously. Hence only plants with long tap roots (like berseem) are able to survive injuries caused by cracking and produce profitable crops. At the end of one year, after the fall of the succeeding flood, these soils have largely lost their objectionable features. Their fertility however, increases for several years, provided no new deposits of great thickness are made upon them. The defects of these soils are attributed to the large amount of colloidal clay which they contain. Among the causes for their gradual improvement, the author considers most important, the appearance in the soils of more concentrated solutions of electrolytes capable of coagulating the colloidal clay and thus permitting the loosening of the soil. This concentration of the soil solutions is due to the capillary rise of the subterranean water and its ultimate evaporation at the surface. The soluble salts of calcium, chiefly chloride, oppose the formation of carbonate of soda and prevent, by the aeration which they permit, the transformation into this carbonate of alkaline bicarbonates found so abundant in Egyptian soils, which transformation renders the soil more or less unproductive.—*Geo. F. Freeman.*

## TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*
E. B. Payson, *Assistant Editor*

### GENERAL

301. Anonymous. [Abstract of: **The Thirty-fourth Annual Report of the Watson Botanical Exchange Club for 1917–1918.**] Jour. Botany 57: 314–318. 1919.

302. Anonymous. [Rev. of: Farrer, Reginald. **The English rock garden.** *2 vol., 4to. lxiv + 504 and viii + 524 p., 102 pl.* T. C. & E. C. Jack: London and Edinburgh.] Jour. Botany 57: 354–357. 1919.—See Bot. Absts. 5, Entry 1792.

303. B., E. G. [Rev. of: Gamble, J. S. **Flora of the Presidency of Madras, Part III.** *P. 391–575.* Adlard & Son.] Jour. Botany 58: 27–28. 1920.

304. Britton, N. L. **Flora of the District of Columbia.** [Rev. of: Hitchcock, A. S., and P. C. Standley, with the assistance of the botanists of Washington. **Flora of the District of Columbia and vicinity.** Contrib. U. S. Nation. Herb. 21: 1-329. *42 pl.* 1919.] Torreya 19: 244-246. 1919.—See Bot. Absts. 4, Entry 1731.

305. Cheeseman, T. F. **Contributions to a fuller knowledge of the flora of New Zealand, No. 6.** Trans. and Proc. New Zealand Inst. 51: 85-92. 1919.—See also Bot. Absts. 6, Entry 367.

306. Chiovenda, L. **Plantae e Catanga a Cl. Dr. H. Bovone lectae.** [**Plants from Catanga collected by Dr. H. Bovone.**] Nuovo Gior. Bot. Ital. 26: 58-85. 1919.—This paper contains a detailed Latin description of a number of plants and a list of others collected by Dr. H. Bovone at Catanga.—*Ernst Artschwager.*

307. Conard, Henry S. **The classification of vascular plants: a review.** Plant World 22: 59-71. 1919.—Certain discrepancies between the standard systematic and morphological texts are discussed, and a classification of the plant kingdom is proposed, which attempts to bring systematic botany into harmony with the most recent morphological discoveries that throw light on the relationships of the larger groups to one another.—*Charles A. Shull.*

308. Conard, H. S. **The general classification of higher plants.** Proc. Iowa Acad. Sci. 25: 237-240. 1920.—The author proposes to divide the plant kingdom into *Thallophyta* and *Embryophyta*, the latter group into *Atracheata* (*Bryophyta*) and *Tracheata* (*Vasculares*), the latter into *Lycopsida* and *Pteropsida*, and the last into *Aspermae* (*Filices*), *Gymnospermae* and *Angiospermae*.—*H. S. Conard.*

309. Coulter, J. M. **Flora of the Congo.** [Rev. of: Wildeman, E. de. **Florae Congolensis.** Bull. Jard. Bot. Bruxelles 4: 361-429. 1914. *Ibid.* 5: 1-108. 1915. *Ibid.* 5: 109-268. 1916. *Ibid.* 6: 1-129. *35 pl.* 1919. Bot. Gaz. 68: 232. 1919.

310. Engler, A. **Kurzer Bericht über in den letzten zehn Jahren von deutschen Botanikern unternommenen Forschungsexpeditionen nach Afrika und Papuasien.** [**Short report on the exploring expeditions in Africa and Papuasia undertaken by German botanists during the last ten years.**] Bot. Jahrb. 55 (Beiheft): 5-32. 1919.—A report read at the twelfth meeting of the "Freien Vereinigung der Systematischen Botaniker und Pflanzengeographen zu Würzburg," Aug., 1917.—(*I*) *Botanical exploring expeditions to West Africa.* (a) The expedition of C. Ledermann to North Kamerun and Adamaua. This expedition was absent about one year in 1908 and 1909. The number of collections reached 6492, and the geographical data obtained were extensive; the expedition therefore was very important for the region covered, which had been little visited before. In many cases collections made at the same place both in the wet and the dry season gave data not before at hand. (b) Expeditions of Dr. Mildbraed. Three trips were made; the first, from May, 1907, to September, 1908, was through Central Africa and the Congo Basin. The second, from June, 1910, to March, 1912, extended through the primitive forest from the mouth of the Congo to Kimuenza, Stanley Pool, Bolobo, Bongo and Sanaga, to Molundu and to the grasslands of the French border. Mildbraed finally visited the Island of Annobon where a fine collection of Algae was made. The third expedition, leaving October, 1913, was to New Kamerun. Many specimens were sent to Germany, and many others were prepared, but failed to reach that country on account of the war. —(*II*) *Explorations in East Africa.* (a) Explorations of Hans Meyer in Urundi and Ruanda. This expedition started May, 1911. It furnished little new material, as most of the region had been worked before. A report on this trip has already been made by Meyer. (b) A. Stolz in north Nyassaland, 1900-1912. His collections contain 2760 species and are on the market. He was not primarily a traveller but collected mostly in a few localities. (c) Brehmers' trip in Uluguru, 1913. This expedition was through a rain forest of dense vegetation. The region is described and it is stated that 1038 specimens were collected.—(*III*) *Explorations in Southwest Africa.* Trip of A. Engler, March-May, 1913. Accompanied by Dinter and

Runge, Engler travelled through the sandy deserts, rocky steppes, and bush growth of that region. Vivid descriptions of the vegetation are given.—*(IV) Explorations in Papuasia.* Dr. Lauterbach had collected there in 1890–91, 1896, 1899, and 1900. In 1907–09 came the Guttapercha-Caoutchouc Expedition of the Colonial Committee under Schlechter. From this trip Schlechter reported 116 genera and 1450 species of orchids, 348 of the latter being new. To be mentioned also is the Dutch expedition of Lorentz and Newbury in 1901, of which Versteeg was botanist; also the later German expedition of Leonhard Schultze Jena and Dr. Moskowski. A list is given of the collaborators who have worked on the Lauterbach and Schlechter material.—*K. M. Wiegand.*

311. Jeanpert, Ed. **Énumération des plantes recueillies par M. R. Chudeau dans le Soudan.** **[List of plants collected by M. R. Chudeau in the Soudan.]** Bull. Mus. Hist. Nat. [Paris] 25: 64–68. 1919.

312. Jeanpert, Ed. **Énumération de plantes de Macédoine.** **[Enumeration of plants of Macedonia.]** Bull. Mus. Hist. Nat. [Paris] 25: 391–397, 517–523. 1919.—In these, the first and second papers of a series, the author gives a list of species collected in Macedonia by several collectors with localities of each species when they are known.—*E. B. Payson.*

313. Knowlton, C. H., and Walter Deane. **Reports on the flora of the Boston District.—XXXII.** Rhodora 22: 72–75. 1920.—A continuation of the report of the Committee on Local Flora of the New England Botanical Club. Reported species and their distribution in the district about Boston, Massachusetts.—*James P. Poole.*

314. Pampanini, R. **L'Erbario di Paolo Boccone conservato a Lione.** **[The herbarium of Paolo Boccone at Lyon.]** Nuovo Gior. Bot. Ital. 26: 1–20. 1919.

315. Pampanini, R., and V. Zanon. **Nuovo contributi alla conoscenza della Flora della Cirenaica.** **[New contribution to the knowledge of the flora of Cirenaica.]** Nuovo Gior. Bot. Ital. 26: 205–221. 1919.—A list of vascular plants, fungi and lichens collected in Bengasi during 1917 and 1918, reported for the first time were the following: *Ephedra campylopoda* C. A. Mey., *Roemeria tenuifolia* Pamp., sp. n., *Ranunculus bullatus* L. var. *cyrenaicus* Pamp., var. n. *Linaria Haelava* Chav. var. *cyrenaica* Pamp., var. n.—*Ernst Artschwager.*

316. Pellegrin, François. **Les collections botaniques récoltées par la Mission de délimitation Congo Français-Cameroun.** **[The botanical collections made by the Congo French-Cameroun Mission of delimitation.]** Bull. Mus. Hist. Nat. [Paris] 25: 381–386, 506–511. 1919.—In continuation of a similar list previously published, the author gives a list of plants collected by the Mission with various notes concerning the species. *Mostuea Periquetii* is described as a species new to science.—*E. B. Payson.*

317. Schaffner, John H. **Additions to the catalog of Ohio vascular plants for 1919.** Ohio Jour. Sci. 20: 131–136. 1920.—A check list of 72 additions to the State Herbarium gives their local distribution, various changes in nomenclature and other corrections.—*H. D. Hooker, Jr.*

318. Schoolbred, W. A. **The flora of Chepstow.** *8vo. X + 140 p., 1 map.* Taylor and Francis: London, 1920.—The region covered by this flora is that of the lower part of the Valley of the Wye in South Wales and comprises approximately an area of 100 square miles. About 1000 species of flowering plants, ferns, and fern-allies are enumerated and 179 species of mosses supplement this list. The habitat of each species is carefully recorded, but there are no descriptions nor keys.—*J. M. Greenman.*

319. Sedgwick, L. J. **On the use of the term "variety" in systematics.** Jour. Indian Bot. 1: 120–124. 1919.—The author discusses the problem of "whether the term variety as used in our floras is applied to one natural phenomenon only," and if not, "whether there is any way of separating out the various phenomena hitherto confused under the one term,

and assigning to each a separate term." He points out the following different kinds of varieties, and suggests a nomenclature for each: freaks, to be described separately; geographical forms, the trinomial system; edaphic forms, "the term *varietas* followed by the ordinary ecological term such as *xerophytica*, *halophytica*, etc.;" forms of varying life duration, "*varietas annua*, *biennia*, etc.;" seasonal forms, "*varietas hyemalis*, *aestivalis*, etc.;" pure lines and elementary species, "*varietas Mendeliana*, followed by the letters of the Greek alphabet;" forms of inconstant species and "DeVriesian mutants," "*forma* is the ultimate unit;" and hybrids, "the usual multiplication sign."—*Winfield Dudgeon.*

320. Wilson, E. H. **The Liukiu Islands and their ligneous vegetation.** Jour. Arnold Arboretum 1: 171–186. 1920.

## PTERIDOPHYTES

321. Bonaparte, R. **Les ptéridophytes de l'Indo-Chine. Première partie. [The Pteridophytes of Indo-China. Part I.]** Notes Pteridologiques 7: 1–190. 1919.—This work contains an analytical key to the families of ferns and fern-allies, and a consideration of the Indo-Chinese representatives of the families Hymenophyllaceae, Gleicheniaceae, Schizaeaceae, and Cyatheaceae, with descriptions of the genera and species, keys, and an extended citation of synonyms and specimens under each species. To the work is appended a list of the ferns cultivated in the botanical garden at Saigon. No new forms are described.—*E. D. Merrill.*

322. Copeland, E. B. **A few new ferns from Mt. Bulusan.** Leafl. Philippine Bot. 9: 3107–3111. 1920.—The following ferns from Luzon are described as new: *Davallia Elmeri*, *Dennstaedtia philippinensis*, *Cyathea bicolana*, *C. bulusanensis*, and *Athyrium ebenirachis*. The genus *Haplodictyon* as proposed by Presl, long placed as a synonym of *Dryopteris*, is reinstated, and *H. majus* is described as new.—*E. D. Merrill.*

323. Dodge, Raynal. **Aspidium cristatum × marginale and A. simulatum.** Amer. Fern Jour. 9: 73–80. 1919.—See Bot. Absts. 5, Entry 353.

324. Fitzpatrick, T. J. **The fern flora of Nebraska. I.** Amer. Fern Jour. 10: 5–15. 1920.

325. Holloway, J. E. **Studies in the New Zealand species of the genus Lycopodium: Part III. The plasticity of the species.** Trans. and Proc. New Zealand Inst. 51: 161–261. *Pl. 9–14, 16 fig.* 1919.—See Bot. Absts. 5, Entry 1892.

326. Hopkins, L. S. **A crested form of the Lady fern.** Amer. Fern Jour. 9: 86–88. *Pl. 4.* 1919.—In the summer of 1916 the author found near Windham, Ohio, a crested form of the Lady fern. He lifted the plant and has it growing at his home in Kent, Ohio. He suggests the name *Athyrium angustum* var. *cristatum* var. nov. for this form.—*F. C. Anderson.*

327. Leonard, Elizabeth J. **The genus Taenitis, with some notes on the remaining Taenitidenae.** Sci. Proc. Roy. Dublin Soc. 15: 254–273. *1 pl.* 1918.—This genus comprises, at present, but one species, *Taenitis blechnoides*, Willd. Related genera include *Eschatogramme*, *Drymoglossum*, *Paltonium* and *Hymenolepsis*. The author concludes that all, except possibly *Paltonium*, are blechnoid derivatives.—*A. E. Waller.*

328. Lewis, Charles Smith. **The Woodsias of Quechee.** Amer. Fern Jour. 10: 23–25. 1920.

329. Maxon, William R. **Notes on American ferns. XIV.** Amer. Fern Jour. 9: 67–73. 1919.—*Dicranopteris flexuosa* (Schrad.) Underw., the only known representative of the family Gleicheniaceae in the United States, found in 1914 growing near Delschamps Station in the Mobile Bay region of Alabama, is probably wiped out of existence by the railroad company removing the clay bank on which the fern grew. The locality data for *Athyrium americanum*

(Butters) Maxon is corrected. *Woodwardia Chamissoi* Brack and *W. spinulosa* Mart & Gal. are compared and the six main points of distinction are listed. *Notholaena limitanea* Maxon, sp. nov. and *N. limitanea mexicana* Maxon, subsp. nov. are described and localities listed. Distinctive characters of *N. dealbata* (Pursh) Kunze and *N. nivea* are also given.—*F. C. Anderson.*

330. MAXON, WILLIAM R. **Notes on American ferns. XV.** Amer. Fern Jour. **10:** 1–4. 1920.—Of the five species discussed, the range for four of them is extended. One species, *Lycopodium alpinum* L., is new for the United States. On examining specimens from Glacier National Park it seems necessary to regard *Polystichum Jenningsi* Hopkins as a synonym of *P. Andersoni* Hopkins.—*F. C. Anderson.*

331. PRAEGER, R. LL. **Asplenium adiantum-nigrum var. acutum.** Irish Nat. **28:** 13–19. *Pl. 2.* 1919.—A review of the literature shows that several forms have been confused. Two main types are here recognized and these are related to certain areas in Ireland and elsewhere. —*W. E. Praeger.*

332. RIDLEY, H. N. **The fern-allies and Characeae of the Malay Peninsula.** Jour. Roy. Asiatic Soc. Straits Branch **80:** 139–164. 1919.—A descriptive consideration of the groups indicated, *Lycopodium* with 13 species, *Psilotum* with 2, *Selaginella* with 37; *Azolla* with 1; *Marsilea* with 1; *Nitella* with 3, and *Chara* with 1. The following species of *Selaginella* are described as new: *S. Curtisii*, *S. selangorensis* Bedd., *S. calcarea*, *S. strigosa* Bedd., *S. pensile*, *S. microdendron*, *S. lankawiensis*, *S. cuprea*, *S. illustris*, *S. reptans*, *S. scabrida*, and *S. montana*. —*E. D. Merrill.*

## SPERMATOPHYTES

333. BAKER, E. G. **The African species of Allophylus.** Jour. Botany **57:** 154–160. 1919. —The genus *Allophylus* was founded by LINNAEUS in 1747 in the Flora Zeylanica. LINNAEUS also described *Schmidelia* in the Mantissa. These are now considered synonyms. In 1859–60 SANDER gave under *Schmidelia* five species, and in 1868 the author's father described twelve species. In 1895 RADLKOFER, in ENGLER AND PRANTL's Nat. Pflanzenf., mentions eighteen species in Africa and Madagascar. The present author criticises RADLKOFER's primary division into unifoliate and trifoliate leaves, and his subsequent divisions on the basis of simple or branched thyrse. GILG also has made important contributions to our knowledge of the genus. The author gives in this installment a key to the African species, following closely RADLKOFER's sequence, with the recently described novelties interpolated. Notes on synonymy and distribution are given on 14 of the 73 species treated in the key. The following species are described as new: *Allophylus nigricans* from Nigeria, and *A. lasiopus* from Cameroons.—*K. M. Wiegand.*

334. BECCARI, O. **The palms of the Philippine Islands.** Philippine Jour. Sci. **14:** 295–362. *3 pl.* 1919.

335. BECK v. MANNAGETTA, AND G. LERCHENAU. **Wacholderbeeren mit entblöszten Samen. [Juniper berries with exposed seeds.]** Sitzungsber. K. Akad. Wiss. Wien (Math.-Nat. Kl.) **126:** 403–419. *31 fig.* 1917.—See Bot. Absts. 4, Entry 983.

336. BENNETT, ARTHUR. **× Potamogeton dualus Hagstrom (P. panormitanus Biv. × pusillus L.).** Jour. Botany **57:** 285. 1919.—A note on the occurrence of the hybrid in York and Shropshire; also the record of *P. panormitanus* from Ireland, as *P. pusillus* L. var. *tenuissimus* Koch.—*K. M. Wiegand.*

337. BENOIST, R. **Description d'espèces nouvelles de Phanérogames de la Guyane Française. [Descriptions of new species of Phanerogams from French Guiana.]** Bull. Mus. Hist. Nat. [Paris] **25:** 296–299. 1919.—The following new species are described: *Capparis maroniensis*, *Andira Wachenheimi*, *Swartzia similis*, and *Helicostylis pedunculata*.—*E. B. Payson.*

338. Benoist, R. **Guenetia, genre nouveau de la famille de Tiliacées. [Guenetia, a new genus of the family Tiliaceae.]** Bull. Mus. Hist. Nat. [Paris] 25: 387–389. 1919.—The author publishes the genus **Guenetia** Sagot, with the single species, *G. macrosperma* Sagot, as new to science from French Guiana.—*E. B. Payson.*

339. Benoist, R. **Les Licania (Chrysobalanacèes) de la Guyane française. [The Licanias (Chrysobalanaceae) of French Guiana.]** Bull. Mus. Hist. Nat. [Paris] 25: 512-516. 1919.—The author presents a résumé of all the species of *Licania* known to occur in French Guiana. The following new species and varieties are characterized: *Licania heteromorpha* Benth. var. *grandifolia*, *L. davillaefolia*, *L. cyathodes*, *L. canescens*, *L. leptostachya* Benth. var. *crassifolia* (*L. crassifolia* Benth.), *L. galibica*, and *L. pruinosa*.—*E. B. Payson.*

340. Blake, S. F. **A preliminary revision of the North American and West Indian avocados (Persea spp.).** Jour. Washington [D. C.] Acad. Sci. 10: 9–21. *2 fig.* 1920.—A list of five species is given, of which two, *Persea cinerascens* and *P. leiogyna*, are described as new.—*Helen M. Gilkey.*

341. Blatter, E. **Flora Arabica, Part 1. Ranunculaceae-Moringaceae.** Rec. Bot. Surv. India 8: 1–123. 1919.—A systematic and bibliographic enumeration of all known Arabian plants of the families indicated following the Bentham and Hooker system. Specimens are cited and the distribution of each species is indicated. There are no keys or descriptions.—*E. D. Merrill.*

342. Blatter, E., P. F. Hallberg, and C. McCann. **Contributions toward a flora of Baluchistan.** Jour. Indian Bot. 1: 54–59. 1919. [To be continued.]—Notes on structure, synonymy and distribution are given of species in the following genera: *Clematis*, *Adonis*, *Ranunculus*, *Cocculus*, *Berberis*, *Hypecoum*, *Fumaria*, *Arabis*, *Barbarea*, *Farsetia*, *Malcolmia*, *Goldbachia*, *Sisymbrium*, *Brassica*, *Eruca*, *Capsella*, *Lepidium*, *Isatis*, *Physorhynchus*, *Cleome*, *Maerua*, *Capparis* and *Ochradenus*. The following species are described as new: *Ranunculus pseudomuricatus* Blatt. & Hall., *Goldbachia hispida* Blatt. & Hall., and *Cleome Hotsonii* Blatt. & Hall. Four species of *Farsetia* are listed without names. [See also next following Entry, 343.]—*K. M. Wiegand.*

343. Blatter, E., P. F. Hallberg, and C. McCann. **Contributions towards a flora of Baluchistan.** Jour. Indian Bot. 1: 84–91, 128–138, 169–178, 226–236, 263–270. 1919–1920.—A continuation of the flora, arranged according to Bentham and Hooker's system of classification, extending from Resedaceae to Euphorbiaceae. *Tamarix longe-pedunculata* and *Reaumuria panjgurica* (Tamaricaceae), *Fagonia spinosissima* and *Zygophyllum trialatum* (Zygophyllaceae), *Dorycnium villosum*, *Indigofera paucifolioides*, and *Calophaca tomentosa* (Leguminosae), and *Gaillonia macrantha* (Rubiaceae) are described as new species. [See also next preceding Entry, 342.]—*Winfield Dudgeon.*

344. Boulenger, G. A. **Some roses from Dorsetshire.** Jour. Botany 58: 16–21. 1920.—The paper contains notes made while spending a fortnight at Studland in 1919. Some forms could not be placed exactly in Major Wolley-Dod's summary of the knowledge of British roses. Extended notes are given on *R. ptychophylla*, *R. arvensis* var. *major* Coste, *R. arvensis* × *micrantha ?*, *R. canina* var. *oblonga* (two other varieties of *R. canina* are noted and keyed), and *R. micrantha* var. *Lusseri* (related to *R. rubiginosa*). Of these *R. ptychophylla*, a relative of *R. stylosa*, is described as new, and *R. canina* var. *oblonga* (Déségl. & Rip.) as a new combination.—*K. M. Wiegand.*

345. Breakwell, E. **A remarkable fodder plant. Shearman's clover (Trifolium fragiferum var.).** Agric. Gaz. New South Wales 31: 245–250. *4 fig.* 1920.—See Bot. Absts. 5, Entry 1109.

346. Breakwell, E. **Popular descriptions of grasses. The Chloris grasses.** Agric. Gaz. New South Wales 31: 309-314. *Fig. 1–4.* 1920.—See Bot. Absts. 6, Entry 6.

347. Britten, James. **Salsola caffra Sparrman.** Jour. Botany 58: 24. 1920.—This name, published in Sparrman's Voyage to the Cape of Good Hope in 1785, has not subsequently been recognized. It is synonymous with *S. aphylla* L. f. 1781.—*K. M. Wiegand.*

348. Britten, James. **Schrankia microphylla.** Jour. Botany 58: 89–90. 1920.—The author calls attention to the fact that J. F. Macbride has shown that *Schrankia microphylla* (Dryand.) Macbride must replace *S. angustata* Torr. & Gray. He notes that in 1898 he himself called attention to this but did not make the combination. Circumstances connected with the original publication of the specific name *microphylla* are somewhat confusing. The history of the name is outlined in detail, and it is shown that Solander, not Dryand., was the original author, though not the first to publish the name. *S. microphylla* (Dryand.) Macbride is *Mimosa uncinata* Dryand, *M. Intsia* Walt., and *S. angustata* T. & G.—*K. M. Wiegand.*

349. Brühl, P. **On the systematic position of Lindenbergia, Lehmann.** *6 p.* Printed privately: Calcutta, 1919.—The author has made a study of the aestivation of the corolla, the stamens, the fruit, and other characters of a number of Indian species of *Lindenbergia* and related genera of Scrophulariaceae. He concludes that *Lindenbergia* should be assigned to a position in the series Rhinantheae, either near the genus *Euphrasia*, or at the head of the series since it appears to be a connecting link with the tribe Gratioileae of the series Antirrhinideae. Pertinent literature is summarized.—*Winfield Dudgeon.*

350. Brühl, P. **Note on Lindenbergia urticifolia, Lehm. and Lindenbergia polyantha, Royle.** *20 p.* Printed privately: Calcutta, 1919.—The author concludes that *L. urticifolia* Lehm. and *L. polyantha* Royle are not reducible to a single species, but that on the basis of differences in aestivation, hairiness of the ovary and style base, and shape of the upper lip of the corolla, they constitute two well defined form groups, for which he proposes the old combinations *L. muraria* Roxb. and *L. indica* Linn. respectively. The former is essentially Himalayan while the latter belongs to the Indo-Gangetic Plain. A summary of the literature on the two species is given.—*Winfield Dudgeon.*

351. Burkill, I. H. **The Gardens' Hevea tree No. 1844.—H. confusa, Hemsl.** Gardens' Bull. Straits Settlements 2: 113–115. 1919.

352. Burkill, I. H. **Dioscorea kegeliana, Griseb., the "Yam poule" of the West Indies.** Gardens' Bull. Straits Settlements 2: 158. 1919.

353. Burns, W. **Variations in Bombay Strigas.** Jour. Indian Bot. 1: 212–216. *4 fig.* 1920.—The author records variations in the number of ribs of the calyx, flower color, and other characters in *Striga lutea*, *S. densiflora*, *S. euphrasioides*, and *S. orobanchoides* found in the Bombay Presidency.—*Winfield Dudgeon.*

354. Buscalioni, L., and G. Muscatello. **Studio monografico sulle Specie americane del Gen. Saurauia Willd. [Monograph of the American species of Saurauia.]** Malpighia 28: 371–402. 1919. [Continued from earlier numbers, and to be continued.]—This is a detailed study especially of the Mexican species of *Saurauia*, a genus of the Dilleniaceae. Tables are given comparing closely related species character by character. *Saurauia pseudopringlei* and *S. pseudopedunculata* are described in detail.—*L. W. Riddle.*

355. Calder, C. C. **The species of Oxalis now wild in India.** Rec. Bot. Surv. India 6: 325–341. *9 pl.* 1919.—Nine species are recognized, described, and figured. Synonyms are given and the distribution of each species indicated.—*E. D. Merrill.*

356. Calder, C. C. **A new Indian Vernonia.** Rec. Bot. Surv. India 6: 343–345. *Pl. 10.* 1919.—*Vernonia Fysoni* is described and figured.—*E. D. Merrill.*

357. Camus, Aimée. **Note sur le genre Mnesithea Kunth (Graminées). [Note on the genus Mnesithea Kunth (Gramineae).]** Bull. Mus. Hist. Nat. [Paris] 25: 56–59. 1919.—The genus *Mnesithea* is confirmed and to it are transferred several species from southern Asia previously attached to the genera *Rottboellia* and *Ophiurus*. The three genera are contrasted and a key is provided for the species assigned to *Mnesithea*. The following new combinations result: *Mnesithea geminata* (*Rottboellia geminata* Hackel), *M. mollicoma* (*Rottboellia mollicoma* Hance), *M. merguensis* (*Rottboellia merguensis* Hook. f.).—*E. B. Payson.*

358. Camus, Aimée. **Note sur deux espèces nouvelles d'Andropogonées (Graminées). [Note on two new species of Andropogoneae (Gramineae).]** Bull. Mus. Hist. Nat. [Paris] 25: 133–136. 1919.—*Cymbopogon Eberhardtii* and *C. Chevalieri*, native to Annam, are described as new to science.—*E. B. Payson.*

359. Camus, Aimée. **Graminées nouvelles de l'Asie orientale. [New Gramineae from eastern Asia.]** Bull. Mus. Hist. Nat. [Paris] 25: 202–204. 1919.—The following species are described as new to science: *Tricholaena Chevalieri*, *Ischaemum Eberhardtii*, *Andropogon quinhonensis*.—*E. B. Payson.*

360. Camus, Aimée. **Quelques espèces nouvelles de Graminées d'Asie. [Several new species of Gramineae from Asia.]** Bull. Mus. Hist. Nat. [Paris] 25: 284–287. 1919.—The following species are described as new to science: *Ischaemum tenuifolium*, *Lophopogon intermedius*, *Apocopis cochinchinensis* and *Germainia Thorelii*.—*E. B. Payson.*

361. Camus, Aimée. **Espèces et variétés nouvelles de Graminées asiatiques. [New species and varieties of Asiatic Gramineae.]** Bull. Mus. Hist. Nat. [Paris] 25: 367-371. 1919.—The following species and varieties are described as new to science: *Isachne Chevalieri*, *Arundinella rupestris*, *A. setosa* Trin. var. *latifolia*, *Rottboellia tonkinensis*, *Andropogon pertusus* Willd. var. *barbatus*, and *Aristida Boisii*.—*E. B. Payson.*

362. Camus, Aimée. **Note sur le Lophatherum gracile Brongn. (Graminées.) [Note on Lophatherum gracile Brongn. (Gramineae.)]** Bull. Mus. Hist. Nat. [Paris] 25: 494–496. 1919.—A group of closely related forms are here regarded as varieties of one polymorphic species. The following new varieties are characterized and new varietal combinations made: *Lophatherum gracile* Brongn. var. *genuinum* (*L. gracile* Brongn.), *L. gracile* Brongn. var. *multiflorum* (*L. multiflorum* Steudel.), *L. gracile* Brongn. var. *pilosum*, *L. gracile* Brongn. var. *hispidum*, *L. gracile* Brongn. var. *elatum* (*L. elatum* Zoll.), *L. gracile* Brongn. var. *intermedium*, *L. gracile* Brongn. var. *zeylanicum* (*L. zeylanicum* Hook. f.), *L. gracile* Brongn. var. *cochinchinense*.—*E. B. Payson.*

363. Camus, Aimée. **Variétés nouvelles de Graminées de l'Asie Orientale. [New varieties of grasses from eastern Asia.]** Bull. Mus. Hist. Nat. [Paris] 25: 497–498. 1919.—The following varieties are described as new to science: *Sorghum halepense* Pers. var. *mekongense*, *Erianthus fastigiatus* Nees var. *tonkinensis*, *Ischaemum aristatum* L. var. *lanuginosum*, *I. rugosum* Salisb. var. *nanum*, *Eragrostis* nigra Nees var. *cochinchinensis*, *E. amabilis* Wight & Arn. var. *ongiemensis*.—*E. B. Payson.*

364. Cardot, J. **Sur les charactères distinctifs des Eriobotrya (Rosacées) et genres voisins, et observations sur quelques espèces asiatiques d'Eriobotrya. [On the distinctive characters of Eriobotrya (Rosaceae) and related genera, and observations on a few Asiatic species of Eriobotrya.]** Bull. Mus. Hist. Nat. [Paris] 25: 205–207. 1919.

365. Cardot, J. **Notes sur des espèces asiatiques du genre Photinia, section Euphotinia. [Notes on the Asiatic species of the genus Photinia, section Euphotinia.]** Bull. Mus. Hist. Nat. [Paris] 25: 398–404. 1919.—Detailed notes are given concerning 13 species of *Photinia*. The following new combinations are made: *Photinia Davidiana* (*Stranvaesia Davidiana* Dcne.) and *P. undulata* (*Stranvaesia undulata* Dcne.).—*E. B. Payson.*

366. Carse, H. **A new variety of Pteris macilenta.** Trans. and Proc. New Zealand Inst. 51: 95. 1919.—*Pteris macilenta* A. Rich. var. *saxatilis* is described from Coromandel Peninsula, New Zealand.—*L. W. Riddle.*

367. Cheeseman, T. F. **Some additions to the New Zealand flora.** Trans. and Proc. New Zealand Inst. 51: 92–95. 1919.—Describes four new species of flowering plants; *Ligusticum petraeum, Veronica Birleyi, Earina aestivalis, Thelymitra aemula.*—*L. W. Riddle.*

368. Chermezon, H. **Un genre nouveau de Cypéracées. [A new genus of the Cyperaceae.]** Bull. Mus. Hist Nat. [Paris] 25: 60–63. 1919.—**Mariscopsis** is described as a genus new to science and to it is referred one species, *M. suaveolens* (*Cyperus suaveolens* Boivin mss.), from Madagascar and Zanzibar. The relation of the new genus to allied genera in this family is indicated by a dichotomous key.—*E. B. Payson.*

369. Chermezon, H. **Pycreus (Cypéracées) nouveaux de Madagascar. [New species of Pycreus (Cyperaceae) from Madagascar.]** Bull. Mus. Hist. Nat. [Paris] 25: 137–140. 1919.—The following species are described as new to science: *Pycreus squarrosulus, P. antsirabensis, P. vavavatensis, P. simulans, P. Alleizettei.*—*E. B. Payson.*

370. Chermezon, H. **Kyllingia (Cypéracées) nouveaux de Madagascar. [New Kyllingias (Cyperaceae) from Madagascar.]** Bull. Mus. Hist. Nat. [Paris] 25: 208–212. 1919.—The following new species are described: *Kyllingia coriacea, K. planiculmis* C. B. Clarke, *K. plurifoliata, K. imerinensis, K. Perrieri,* and *K. intricata.*—*E. B. Payson.*

371. Chermezon, H. **Mariscus (Cypéracées) nouveaux de Madagascar. [New species of Mariscus (Cyperaceae) from Madagascar.]** Bull. Mus. Hist. Nat. [Paris] 25: 300–304, 405–410 1919.—The following new species are described: *Mariscus detersus* C. B. Clarke, *M. Perrieri, M. goniobolbus, M. Aster* C. B. Clarke, *M. Humberti, M. Viguieri, M. fallax, M. splendens, M. manongarivensis, M. longibracteatus, M. rubrotinctus, M. varicus* C. B. Clarke, and *M. arcuato-reflexus.*—*E. B. Payson.*

372. Chiovenda, E. **L'Androsace Vandellii (Turra) Chiov.** Nuovo Gior. Bot. Ital. 26: 21-29. 1919.—Historical sketch of the treatment of the genus by Haller, Scleicher, Lamark and others. New classification with subdivision into three groups: α. *multiflora,* β. *tomentosa,* and γ. *argentea.*—*Ernst Artschwager.*

373. Chirtoiü, Marie. **Observations sur les Lacistéme et la situation systematique de ce genre. [Observations on the species of Lacistema and the systematic position of this genus.]** Bull. Soc. Bot. Genève 10: 317–349. *18 fig.* 1918.—*Lacistema,* the only genus of the family Lacistemaceae, is placed by Engler—"Die natürliche Pflanzenfamilien"—between the families Piperaceae and Salicaceae. Miss Chirtoiü places the genus *Lacistema* in a separate family between Violaceae and Flacourtiaceae. This change of classification was the result of a series of anatomical and morphological studies on various species of *Lacistema.* The glandular pubescence of *Piperus,* the multiple epidermis of *Piper* are not found in *Lacistema.* Calcium oxalate is abundant in the cortex of *Lacistema* but varies in the Piperaceae. The distribution of the vascular bundles in *Peperomia* and in *Piper* are monocotyledonous but in *Lacistema* dicotyledonous in distribution. In Piperaceae placentation is parietal but only apparently so in *Lacistema.* In *Lacistema* the flowers are hermaphrodite and the albumen is zygomorphic.—*W. H. Emig.*

374. Chirtoiü, Marie. **Remarques sur le Symplocos Klotzschii et les affinités des Symplocacées. [Remarks on Symplocos Klotzschii and the affinities of Symplocaceae.]** Bull. Soc. Bot. Genève 10: 350–361. *5 fig.* 1918.—The ovules of *Symplocos* have large integuments and a small nucellus. The integument develops with the appearance of the mother cell sporangia. The fruit is a kind of drupe at the beginning and the walls formed by the hypanthium become sclerified and surround one or two seeds with reduced albumen. The ovule possesses the

characteristic epithelium of most of the Gamopetalae. The Symplocaceae as related to the gamopetalous plants with the parietal type of placentation as found in the Cucurbitaceae.—*W. H. Emig.*

375. Cohen Stuart, C. P. **Le nom scientifique de la plante de thé.** [The scientific name of the tea plant.] Bull. Agric. Inst. Sci. Saigon 1: 350–361. 1919.—The author prefers the use of the binomial *Camellia theifera* (Griff.) Dyer, claiming that the binomial *Thea sinensis* Linn. is inexact.—*E. D. Merrill.*

376. Coker, W. C. **The distribution of Rhododendron catawbiense, with remarks on a new form.** Jour. Elisha Mitchell Sci. Soc. 35: 76–82. *Pl. 19–22.* 1919.—A map is given (*Pl. 22*) showing a much more extended range for *catawbiense* than heretofore supposed. A form of the species growing in central North Carolina at low elevations is described as forma *insularis*. The distribution of other species is also indicated in part.—*W. C. Coker.*

377. Conard, H. S. **The white water-lily of McGregor, Iowa.** Proc. Iowa Acad. Sci. 25: 235–236. *6 fig.* 1920.—Description of a water-lily found also in Clear Lake, Iowa, combining characteristics of *Nymphaea odorata* and *N. tuberosa*, and variable in respect to certain of these characteristics.—*H. S. Conard.*

378. Constantin, J. **Note sur le Lang-rhôa (Orchidée).** [Note concerning the Lang-rhoa (Orchidaceae).] Bull. Mus. Hist. Nat. [Paris] 25: 218–221. 1919.—The author is unable to identify a certain perfume plant from China with any species of *Cypripedium* known from that country and proposes the provisional name *Cypripedium lang-rhoa* for it. The specific name is taken from the Chinese name of the plant. No material has been seen and the provisional description is drawn from a photograph.—*E. B. Payson.*

379. Coulter, J. M. **North American flora.** [Rev. of: (1) Rydberg, P. A. **Psoraleae.** (2) Pennell, F. W. **Eysenhardtia.** North American Flora 24: Part 1. Apr., 1919.] Bot. Gaz. 68: 65. 1919.

380. Coulter, J. M. **Opuntia.** [Rev. of: Griffiths, David. **New and old species of Opuntia.** Bull. Torrey Bot. Club. 46: 195–206. *2 pl.* 1919. (See Bot. Absts. 3, Entry 1826.)] Bot. Gaz. 68: 312. 1919.

381. Coulter, J. M. [Rev. of: Valeton, Th. **New notes on the Zingiberaceae of Java and Malaya.** Bull. Jard. Bot. Buitenzorg. 27. *168 p., 30 pl.* 1918. (See Bot. Absts. 3, Entry 1322.)] Bot. Gaz. 68: 152. 1919.

382. Danguy, Paul. **Descriptions de quatre Méliacées de Madagascar.** [Descriptions of four species of Meliaceae from Madagascar.] Bull. Mus. Hist. Nat. [Paris] 25: 364–366. 1919.—The following new species are described: *Turraea Geayi*, *T. Decaryana*, *T. Humberti*, and *T. macrantha*.—*E. B. Payson.*

383. Daveau, J. **Ficus Saussreana et F. eriobotryoides Kunth et Bouché.** Rev. Hortic. Paris] 91: 389. 1919.—See Bot. Absts. 5, Entry 1809.

384. De Candolle, Casimir. **New species of Piper from Panama.** Smithsonian Misc. Coll. 71⁶: 1–17. 1920.—In this paper, based upon the collections of H. Pittier and W. R. Maxon, the following new species and varieties are described: *Piper minutispicum*, *P. sperdinum*, *P. chiriquinum*, *P. hirtellipetiolum*, *P. palmasanum*, *P. taboganum*. *P. persubulatum*, *P. latibracteum*, *P. pubistipulum*, *P. portobellense*, *P. obaldianum*, *P. dumeticola* var. *panamense*, *P. fatoanum*, *P. pallidibracteum*, *P. aduncum* L. var. *laevifolium*, *P. peracuminatum*, *P. davidianum*, *P. lucigaudens*, *P. erectamentum*, *P. colonense*, *P. villiramulum*, *P. hispidum* Sw. var. *gamboanum*, *P. tenuimucronatum*, *P. Chamissonis* Steud. var. *rubellibracteum*, *P. sambuanum*, *P. callibracteum*, *P. subnudibracteum*, *P. nitidifolium*, *P. garagaranum*, *P. Maxonii*, *P. magnantherum*.—*S. F. Blake.*

385. Dixon, Henry H. **Mahogany and the recognition of some of the different kinds by their microscopic characters.** Sci. Proc. Roy. Dublin Soc. 15: 431–486. *22 pl.* 1918.

386. Doyle, Joseph. **Observations on the morphology of Larix leptolepsis.** Sci. Proc. Roy. Dublin Soc. 15: 310–327. *2 pl.* 1918.—There is a distinct natural affinity between *Larix* and *Pseudotsuga*, not recognized in current systematic classifications.—*A. E. Waller.*

387. Drummond, J. R. **Miliusa and Saccopetalum.** Jour. Indian Bot. 1: 162–168. 1920. —The history of the genera *Miliusa* and *Saccopetalum* (Anonaceae) is reviewed and the characters of the genera and certain species are discussed. The author reduces *Saccopetalum* to *Miliusa*, which he then redefines.—*Winfield Dudgeon.*

388. Dyer, William T. Thiselton. **Flora Capensis: being a systematic description of the plants of the Cape Colony, Caffraria, and Port Natal (and neighbouring territories).** *8vo, Vol. V, Sect II, Part III, p. 385–528.* L. Reeve & Co.: London, 1920.—The present part concludes the elaboration of the Euphorbiaceae by J. Hutchinson and D. Prain and continues with the Ulmaceae by N. E. Brown and the Moraceae by N. E. Brown and J. Hutchinson. The following new species and new combinations are included: *Drypetes natalensis* (*Cyclostemon natalense* Harv.), *D. arguta* (*Cyclostemon argutus* Müll. Arg.), *D. Gerrardii* Hutchinson (*Cyclostemon argutus* Sim., not Müll. Arg.), *Celtis Franksiae* N. E. Brown (*Celtis Soyauxii* Wood, not Engl.).—*J. M. Greenman.*

389. Eames, Edwin H. **Another exceptional specimen of Daucus Carota.** Rhodora 21: 147–148. 1919.—An account of another specimen of a dark-flowered *Daucus Carota L.* (see Rhodora 21: 70. 1919) collected at Bridgeport, Connecticut, Sept. 11, 1918, and now in the Gray Herbarium. In this plant the petals throughout all of the umbels were wholly dark purple. The plant bore several similar compound umbels and was normal in all respects except petal color. The article is concluded with a short discussion relative to abnormal flower-color in this species.—*James P. Poole.*

390. Earle, F. S. **Varieties of sugar cane in Porto Rico.** Jour. Dept. Agric. and Labor Porto Rico 3: 15–55. 1919.—See Bot. Absts. 5, Entry 1133.

391. Elmer, A. D. E. **New woody plants from Mount Maquiling.** Leafl. Philippine Bot. 8: 3069–3105. 1919.—This is article 121 of this publication and consists of the descriptions of new species of flowering plants as follows: *Papualthia Bakeri*, *Desmos elegans*, *Ilex apoensis* Elm. var. *punctata*, *Parsonsia magnifolia*, *Rhaphidophora lagunensis*, *R. stenophylla*, *R. trinervia*, *Heterostemma Herbertii*, *Toxocarpus rubricaulis*, *Capparis viridis*, *Vernonia acuminatissima*, *Erycibe Copelandii*, *Weinmannia luzonensis* Vid. var. *puberula*, *Dillenia reifferschiedia* F.-Vill. var. *rosea*, *Elaeocarpus maquilingensis*, *Antidesma fusicarpum*, *Glochidion canescens*, *Casearia Zschokkei*, *Cyrtandra maquilingensis*, *Cratoxylon arboreum*, *Gomphostemma cinereum*, *Derris canescens*, *Spatholobus sanguineus*, *Viscum loranthi*, *Melastoma Holmani*, *Astronia Merrillii*, *A. Foxworthyi*, *A. maquilingensis*, *Dysoxylum testaceum*, *Ficus maquilingensis*, *Eugenia Silvestrei*, *E. subsulcata*, *E. maquilingensis*, *Freycinetia robusta*, *F. subflagellata*, *Plectronia Mabesae*, *Neonauclea Kobbei*, *Pegia philippinensis*, *Lepisanthes perviridis*, *Palaquium montanum*, *Leea pauciflora*, and *Leea luzonensis*.—*E. D. Merrill.*

392. Évrard, F. **Un Alangium (Cornacees) nouveau d'Indo-chine. [A new Alangium (Cornaceae) from Indo-China.]** Bull. Mus. Hist. Nat. [Paris] 25: 524–525. *1 fig.* 1919.—*Alangium decipiens*, a species new to science, is described and illustrated.—*E. B. Payson.*

393. Farwell, Oliver A. **Tsuga americana (Mill.) Farwell, a final word.** Rhodora 21: 108–109. 1919.—In a previous paper (Bull. Torrey Bot. Club 41: 621–629. 1914.), the present writer published the name of our common northern hemlock as *Tsuga americana* (Mill.) Farwell. In a later paper (Rhodora 20: 185–188. 1918), Ivar Tidestrom criticised this new combination, arguing for the retention of the name *Tsuga canadensis* (L.) Carr., and giving

the evidence which he claimed supported his contention. This paper is in answer to the latter and attempts to show wherein Mr. Tidestrom's arguments are not convincing.—*James P. Poole.*

394. Farwell, Oliver Atkins. **Necessary changes in botanical nomenclature.** Rhodora 21: 101–103. 1919.—The Index Kewensis refers *Populus balsamifera* Miller to *P. deltoides* and *P. heterophylla*, but the writer finds that a careful comparison of Miller's description with Linnaeus's description of *P. balsamifera* shows the two to be identical and therefore *P. balsamifera* Miller should be referred to *P balsamifera* L., and that this binomial belongs to the Carolina Poplar, as usually understood, since in the last analysis the Linnaean species is founded on that of Catesby who described this Carolina species. The writer also maintains that the common Balm of Gilead should be *P. tacamahacca* Miller instead of Aiton since it was first published by the former author. A form of the latter with scanty pubescence he published as var. *Michauxii* (Henry) n. comb., and another form generally without cordate leaves and pubescence, as var. *lanceolata* (Marsh) n. comb. This last is the northern Balsam Poplar that has so generally been known as *P. balsamifera*. The new combination is in accordance with priority. *Veronica persica* Poir. is taken up instead of *V. Tournefortii* for the species long known as *V. Buxbaumii*. The reasons for the change are given with the bibliography involved. *Viburnum Opulus* Linn., var. *americanum* (Mill.) Ait. In Rhodora **20**: 14–15. 1918, S. F. Blake gives his reasons for dropping the "(Mill.)" from the authority for this variety and retaining only "Ait." The writer maintains that Blake's argument was erroneously drawn and gives his reason for retaining Miller as an authority.—*James P. Poole.*

395. Fawcett, William, and A. B. Rendle. **Notes on Jamaica plants.** (Continued.) Jour. Botany 57: 312–314. 1919.—Euphorbiaceae. II. Notes are presented on the genera *Mettenia*, *Dendrocousinsia* and *Acalypha*. The following species and varieties are described as new: *Chaetocarpus cubensis*, *Dendrocousinsia alpina* and *Acalypha virgata* L. var. *pubescens*. *Chaetocarpus globosus* (*Mettenia globosus* Griseb.) is a new combination proposed.—*K. M. Wiegand.*

396. Fernald, M. L. **Panicum § Capillaria in New England.** Rhodora 21: 110–114. 1919.—Not being able to reconcile the New England plants of the section *Capillaria* with the treatment published by Hitchcock and Chase in their "North American Species of Panicum," the writer found it desirable to study these plants from a new standpoint. The authors mentioned thrust all the eastern *P. barbipulvinatum* Nash into *P. capillare* and forced much of the northwestern *P. capillare* into *P. barbipulvinatum*. The writer points out that the characters relied upon by Hitchcock and Chase for the separation of these two species do not hold up under the critical examination of the series of specimens in the Gray Herbarium and the herbarium of the New England Botanical Club. He points out other characters of the panicle and of the general habit which serve as a better basis of distinction, but even these are not constant, and the writer, in common with Rydberg, considers that *P. barbipulvinatum* is much better treated as a variety of *P. capillare* than as a distinct species. As a variety it should be called *P. capillare* var. *occidentale* Rydberg. In this study it was also found that the common indigenous species of the river- and lake-shores of most of New England had been merged with the strikingly dissimilar *P. philadelphicum* Bernh., whereas this plant is distinguished at once from *P. capillare* (including *P. barbipulvinatum*) and *P. philadelphicum* by having strictly glabrous pulvini while the latter species have the pulvini obviously hispid. The type sheet of this indigenous New England species was collected by Tuckerman and indicated by him on his herbarium label as a new species, *P. soboliferum*. This name has twice been published in synonymy but was never published by Tuckerman himself. The writer considers it better to allow Tuckerman's name to lapse and to use a name which will be open to no question, and therefore proposes for this species *P. Tuckermani* n. sp. A key is given for the species under consideration. The bibliography and distribution of the established species are given, and for the new species the description, list of characteristic specimens, and the distribution.—*James P. Poole.*

397. FERNALD, M. L. **Rubus idaeus and some of its variations in North America.** Rhodora 21: 89–98. 1919.—A discussion presenting new evidence as to the status of *R. idaeus* and its varieties, especially those in North America. Descriptions of the varieties are given in considerable detail, their synonyms as given by various authors are discussed, the varieties are contrasted with each other and with the typical *R. idaeus*, and their distribution is given. By neither FOCKE nor RYDBERG was *R. idaeus* (typical) admitted as more than an introduced plant in North America, but the writer presents evidence of it being indigenous on the Magdalen Islands, in Minnesota, North and South Dakota, and presumably elsewhere. A key to the variations of this species in eastern America is given with the bibliography and distribution of each. A bibliography of the species confined to western America is also given.—*James P. Poole.*

398. FERNALD, M. L. **Bidens connata Muhl., var. gracilipes, n. var.** Rhodora 21: 103–104. 1919.—The writer gives a description of this new variety, also a list of characteristic specimens and the stations where they were collected, the latter all located on Cape Cod. A comparison of this variety with the somewhat similar *B. connata* var. *petiolata* (Nutt.) Farwell, and with the typical *B. connata*, is also given.—*James P. Poole.*

399. FERNALD, M. L. **Two new Myriophyllums and a species new to the United States.** Rhodora 21: 120–124. 1919.—Description, distribution, and bibliography of *Myriophyllum exalbescens* n. sp. This species has heretofore passed as *M. spicatum* L. in America. The writer points out, however, several differences between the latter species, which is of Eurasia, and the American plant. Description, distribution, and bibliography of *M. magdalense* n. sp. This species which occurs in the Magdalen Islands is like *M. exalbescens* in foliage and in the whitening of the stem upon drying, but is proposed as a new species because the fruit is so unlike that in the latter species. Other points of difference are noted. In the Gray Herbarium among the various species which have been erroneously called by their collectors *Myriophyllum verticillatum*, the writer found a sheet from Farewell Bend, Crook Co., Oregon, collected in July, 1894, by J. B. LEIBERG (no. 465) which proved to be a well known species of the southern hemisphere, *M. elatinoides* Gaudichaud., one of a group of species confined to southern Australia, Tasmania and New Zealand, and America, but not known in Africa or Eurasia. It has never before been reported north of Mexico, but a foot-note to the writer's article states that since this article went into type a sheet has been received from PROF. MORTON E. PECK, collected in Des Chutes River, Oregon, July 27, 1914 (*Peck* no. 5718).—*James P. Poole.*

400. FERNALD, M. L. **A new Polygonum from southeastern Massachusetts.** Rhodora 21: 140–142. 1919.—While exploring the ponds of Plymouth, Massachusetts, in 1913, the author noted a strictly indigenous annual *Polygonum* of the sandy pond-margins which was obviously related to *P. Persicaria* L. but which had more slender and more richly colored spikes. In explorations made in 1918 the plant was found to be universally distributed on Cape Cod, and everywhere a plant strictly of the pond margins, while *P. Persicaria* was naturally abundant near houses and about the farms. The indigenous species held its own peculiar differences with constancy, and more detailed study in the herbarium brought out other points of difference which justify the description of this plant as *Polygonum puritanorum* n. sp. The description and the distribution of the species are given, with comments on the relationship with, and the distinguishing differences between this and allied species.—*James P. Poole.*

401. FERNALD, M. L. **The identity of Angelica lucida.** Rhodora 21: 144–147. 1919.—*Angelica lucida* was described by CORNUT in his "History of Canadian Plants" in 1635. It was soon cultivated in various gardens of Europe, described in numerous works of the 18th century, and was taken up by LINNEUS in the "Species Plantarum" (1753) as a valid species under CORNUT's original name. The species was accepted by post-Linnean authors but after 1840, when TORREY and GRAY cast a doubt upon it, the plant was omitted from most subsequent treatments of the American flora. Subsequently to the publication of the statement by TORREY and GRAY, however, DR. GRAY had for a time surmised that the seashore *Angelica*

of northeastern America now passing as *Coelopleurum actaeifolium*, was *Angelica lucida*, and in the 2nd edition of the Manual, at the end of the account of *Archangelica peregrina*, is the note: "Perhaps it is the *Angelica lucida* L." In the 5th edition (1867), however, the plant was formally taken up as *Archangelica Gmelini* DC., while in Watson and Coulter's revision (ed. 6) it became *Coelopleurum Gmelini* Lebed. The writer finds from familiarity with the plant in the field, and from a comparison of sheets collected in eastern Canada, with Cornut's plate, that the latter author's *Angelica lucida*, published in 1635, actually was of Canadian origin, and that he illustrated a very characteristic small specimen of the species which has recently passed as *Coelopluerum actaeifolium* (Michx.) Coulter & Rose. The plant is, then, reinstated and should hereafter be called *Coelopleurum lucidum* (L.) n. comb. The synonymy and the distribution of the plant are given. A plant differing, in the characters of the involucels, from the typical species is also described as *C. lucidum*, forma *frondosum*, n. f., and the stations where it is known to occur are given.—*James P. Poole.*

402. Fernald, M. L. **The variations of Ranunculus repens.** Rhodora 21: 169. 1919.—The writer gives a brief key to the more pronounced varieties of *Ranunculus repens* L.—*James P. Poole.*

403. Fernald, M. L. **Coreopsis rosea Nutt., forma leucantha, n. f.** Rhodora 21: 171. 1919.—At Buck Pond, Harwich, Mass., in August, 1918, where the ordinary pink form of *Coreopsis rosea* makes a border of color at the margin of the pond, the writer found a milk-white form also abundant, for which he proposes the above name.—*James P. Poole.*

404. Fernald, M. L. **The white-flowered bird's eye primrose.** Rhodora 21: 148. 1919.—The white-flowered form of *Primula mistassinica* Michx. which is occasionally seen, is very abundant in Newfoundland, often being the only color seen. Because of its strong contrast with the typical form of the species, the author designates it: *Primula mistassinica* Michx., forma *leucantha*, n. f. The type specimen was collected on the borders of ponds on the limestone tableland, alt. 200–300 m., Table Mountain, Port à Port Bay.—*James P. Poole.*

405. Fyson, P. F. **The Indian species of Eriocaulon.** Jour. Indian Bot. 1: 49–53. *13 fig.* 1919.—The author presents a synopsis of the groups of *Eriocaulon* occurring in India preliminary to a full revision of the genus soon to be published. He finds that previous authors have failed to note the natural groups; and that Ruhland's treatment in "Das Pflanzenreich" is especially artificial. The characters heretofore used have been largely ecological or otherwise unessential. Eight groups are given, as follows: (I) *Simplicis*, 19 sp., (II) *Setaceum*, 2 sp., (III) *Hirsutae*, 6 sp., (IV) *Anisopetalae*, 6 sp., (V) *Scariosae*, 3 sp., (VI) *Cristato-sepalae*, 8 sp., (VII) *Connato-sepalae* (not in India), (VIII) *Leucantherae*, 6 sp. The species in each group are listed by name but not described; thus eleven new species are named without descriptions. These are as follows: *E. Geoffreyi*, *E. barba-caprae*, *E. roseum*, *E. Dianae*, *E. Sedgwickii*, *E. Rhodae*, *E. Edwardii*, *E. Margaretae*, *E. Eleanorae*, *E. Thomasi*, *E. horsley-kundae*. Much confusion as to the range of species has arisen through faulty understanding of the characters and specific limits. An interesting parallel evolutionary development in several groups is noted and discussed.—*K. M. Wiegand.*

406. Fyson, P. F. **Short notes on distribution, etc.** Jour. Indian Bot. 1: 125–127. *1 fig.* 1919.—A new locality is recorded in India for *Impatiens tangachee* Bedd. The collection is recorded of two blue-flowered plants, identical in other characters with *Heterocarpus glaber* Wight and *H. hirsutus* Wight, species described as having yellow flowers. Apparently *H. glaber* and *H. hirsutus* have yellow flowers at lower altitudes, and blue flowers at higher altitudes, and represent a glabrous and a hairy variety of a single species. It is suggested that in these four plants there are "two pairs of Mendelian allelomorphs segregating." The author found a staminate flower on a carpellate tree of *Hydnocarpus alpinus* Wtk., and calls brief attention to its possible bearing on the problem of sex in flowering plants.—*Winfield Dudgeon.*

407. Gagnepain, F. **Vernonia nouveaux d'Indo-Chine. [New Vernonias from Indo-China.]** Bull. Mus. Hist. Nat. [Paris] 25: 487–493. 1919.—The following species are characterised as new to science: *Vernonia Balansae, V. Bonapartei, V. Chevalieri, V. Eberhardtii, V. macrachaenia, V. Pierrei, V. Principis, V. saigonensis, V. subacualis, V. Thorelii, V. tonkinensis*, and *V. virgata*.—*E. B. Payson.*

408. Gagnepain, F. **Nouveaux Begonia d'Asie; quelques synonymes. [New Begonias from Asia; a few synonyms.]** Bull. Mus. Hist. Nat. [Paris] 25: 194–201, 276–283. *19 fig.* 1919. —The following new species, new names and new specific combinations are proposed: *Begonia Balansaeana, B. baviensis, B. Boisiana, B. Bonii, B. Delavayi, B. Duclouxii, B. Eberhardtii, B. Geoffrayi, B. Harmandii, B. hymenophylla, B. Lecomtei, B. Pierrei, B. siamensis, B. taliensis, B. tonkinensis, B. Wilsonii, B. salsiensis* (*Meziera salaziensis* Gaud.), *B. Decaisneana* (*B. aptera* Decne.) and *B. Hayatae* (*B. aptera* Hayata).—*E. B. Payson.*

409. Gagnepain, F. **Acareosperma, un genre nouveau d'Ampélidacées. [Acareosperma, a new genus of the Ampelidaceae.]** Bull. Mus. Hist. Nat. [Paris] 25: 131–132. 1919.—*Acareosperma Spireanum* from southern Asia is described as a new species and the type of a new genus.—*E. B. Payson.*

410. Gagnepain, F. **Quelques Passifloracées nouvelles ou critiques des genres Adenia et Passiflora. [Some new or critical species of the Passifloraceous genera Adenia and Passiflora.]** Bull. Mus. Hist. Nat. [Paris] 25: 126–130. 1919.—The following species and varieties from southern Asia are characterized as new to science: *Adenia Chevalieri, A. Harmandii, A. parvifolia, A. Pierrei, Passiflora octandra, P. octandra* var. *cochinchinensis, P. octandra* var. *attopensis, P. octandra* var. *glaberrima*.—*E. B. Payson.*

411. Godfery, M. J. **The problem of the British marsh orchids.** Jour. Botany 57: 137–142. 1919.—Are there two or three species of British bog orchids, and are all other forms hybrids of these three? Is *O. praetermissa* Druce a valid species or a hybrid? Is *O. latifolia* a good species or is it mainly *O. praetermissa?* The paper deals with these questions, but without finding their solution. The author considers in detail the value of characters, especially the spotting of the leaves. Mr. Rolfe's contention that *O. praetermissa* is true *O. latifolia* is discussed at length. The author has seen *O. latifolia* in many parts of Europe where *O. praetermissa* is not found. He concludes that while there is no doubt that *O. praetermissa* is the *O. latifolia* of English authors, it is open to question whether it is *O. latifolia* L. as understood on the Continent. Most of the spotted European orchids are sometimes found without spots. Mr. McKechnie has suggested that ring-spotted *latifolia* was originally a hybrid between *maculata* and *praetermissa*. The behavior of other orchid hybrids is compared with this case. All evidence goes to show that when spotted *maculata* is crossed with an unspotted species, the offspring is not spotted. The problems arising here are classified by the author. Two main problems, and seven special points should receive investigation. Hope is expressed that botanists will make some artificial crosses with these parents. It is suggested that soil be used in which the parent grew, as an organism (*Rhizoctonia*) is necessary in order that the seeds may germinate. (See F. E. Weiss, on Seeds and Seedlings of Orchids, Proc. Manchester Microsc. Soc. 1917).—*K. M. Wiegand.*

412. Guérin, P. [Rev. of: Berger, Marie-Gaston. **Étude organographique, anatomique et pharmacologique de la famille des Turnéracées. (Organographic, anatomic and pharmacologic study of the family Turneraceae.)** *270 p. 53 pl.* Vigot Frères: Paris, 1919.] Bull. Sci. Pharm. 26: 533. 1919.—See Bot. Absts. 5, Entry 805.

413. Guillaumin, A. **Contribution à la flore de la Nouvelle-Calédonia. [Contribution to the flora of New Caledonia.]** Bull. Mus. Hist. Nat. [Paris] 25: 213–217, 288–295. 372–378, 499–505. 1919.—In continuation of previous similar articles, the author publishes in these several papers lists of species collected in New Caledonia by various collectors. Critical notes are included and some citation of synonymy. The following new specific diagnoses and new

combinations occur: *Pittosporum dzumacense, Psychotria microglossa* Baill. (*Uragoga microglossa* Baill.), *Chrysophyllum Francii* Guillaum. & Dubard, and *Calycorectes ovigerus* (*Eugenia ovigera* Brong. & Gris.).—*E. B. Payson.*

414. HERIBERT-NILSSON, NILS. **Experimentelle Studien über Variabilität, Spaltung, Artbildung und Evolution in der Gattung Salix. [Experimental studies on variability, division, species-formation and evolution in the genus Salix.]** Acta Univ. Lund [Acta Reg. Soc. Physiog. Lund N. S. 29$^{II}$. No. 28.] N. S. 14 (Avd. 2$^{28}$): 1–145. 1918.—This is an extensive account of experimental studies in *Salix*. Many hybrids are designated, described and illustrated. No new species are described.—*E. B. Payson.*

415. HITCHCOCK, A. S. **History of the Mexican grass, Ixophorus unisetus.** Jour. Washington [D. C.] Acad. Sci. 9: 546–551. 1919.—The nomenclatorial history of this species, which has previously been described under five different specific names and referred to four genera, is reviewed and its synonymy cited.—*Helen M. Gilkey.*

416. HOLE, R. S. **A new species of Tamarix.** Indian Forester 45: 247–249. 1919.—*Tamarix Troupii* is the name given to a new species found in the United Provinces, briefly described here.—*E. N. Munns.*

417. HOPKINS, L. S. **The occurrence and distribution of Vasey's pondweed in Northeastern Ohio.** Torreya 19: 243–244. 1919.—*Potamotgeton Vaseyi* Robbins was first collected in Ohio by the writer at Brady's Lake, Portage County, June 22, 1912. It has since been found in Ashtabula County in 1918, and at Sandy Lake, Portage County in 1919. It is not included in SCHAFFNER's "Ohio Catalogue of Vascular Plants." The descriptions in the current manuals are corrected as follows: (1) Fruiting stems are not rare, (2) the larger leaves do not always float, (3) fruiting stems are not limited to shallow water.—*J. C. Nelson.*

418. JACKSON, A. B., AND A. J. WILMOTT. **Barbarea rivularis in Britain.** Jour. Botany 57: 304–306. 1919.—This paper is a reply to one by MARSHALL (Jour. Botany 57: 211. 1919). MARSHALL was in error in recording *B. rivularis* as new to Britain. It was shown (Jour. Botany 54: 202. 1916) that *B. rivularis* is *B. vulgaris* var. *silvestris* Fr., a form not uncommon in Britain. The length of the silique in these various forms, and in a specimen sent to the authors by MARSHALL, is discussed. The strict-fruited form of *B. vulgaris* has frequently been confused with *B. stricta*, but they can scarcely be confused by one who knows them in the field. MARSHALL has overlooked the important contribution by SPRAGUE AND HUTCHINSON (Jour. Botany 46: 106. 1908) where the two forms are clearly differentiated. The shape and size of the lateral lobe of the leaf is of minor importance. SYME may have confused *B. stricta* and *B. rivularis*, as MARSHALL says, but this is uncertain.—*K. M. Wiegand.*

419. JAUCH, BERTHE. **Quelques points de l'anatomie et de la biologie des Polygalacées. [Certain details of the anatomy and biology of Polygalaceae.]** Bull. Soc. Bot. Genève 10: 47–84. *15 fig.* 1918.—A study of *Polygala Chamaebuxus* and closely related species leads the author to consider the family Xanthophyllaceae of GAGNEPAIN as untenable. *Xanthophyllum* is retained, as indicated by CHODAT, in the family *Polygalaceae* because of the structure of the flower and the characteristic pollen. The stamens of Polygalaceae are four-celled, but by reduction of the inferior cells a type with two or three cells may be obtained. The four-celled type is the more primitive. The ovules of Polygalaceae receive parietal vascular bundles. The ovary is divided into two cells by a wall and the placentation is parietal although apparently axillary.—*W. H. Emig.*

420. LAM, H. J. **The Verbenaceae of the Malayan Archipelago, together with those from the Malayan Peninsula, the Philippines, the Bismark-Archipelago, and the Palau- and Caroline Islands.** *371 p., 3 pl.* Groningen, March 31, 1919. [Doctorate Dissertation.]—This work represents a critical revision of the family based on a study of collections in the herbaria of Leiden, Utrecht, and Berlin. Keys for determination and descriptions are given for 28 genera

and 305 species. Two genera and 31 species are described as new to science. The new genera are **Xerocarpa**, monotypic from New Guinea, and **Viticipremna** from the Philippines, New Guinea, and other islands, both of the tribe *Viticoideae*, the first of the subtribe *Teysmanniodendreae*, the second of the subtribe *Viticeae*. New species are: *Callicarpa glabra*, *C. laciniata*, *Clerodendron albiflos*, *C. coccineum*, *C. kalaotoense*, *C. macrocalyx*, *C. membranifolium*, *Faradaya nervosa*, *F. squamata*, *Geunsia Pullei*, *Gmelina Ledermanni*, *G. palawensis*, *G. Schlechteri*, *Premna alba*, *P. angustiflora*, *P. angustifolia*, *P. borneensis*, *P. Curranii*, *P. Ledermanni*, *P. macrophylla*, *P. paulobarbata*, *P. Peekelii*, *P. regularis*, *P. Ruttenii*, *P. sessilifolia*, *Vitex Curranii*, *V. glandulosa*, *V. luteoglandulosa*, *V. macrophylla*, *V. Merrillii*, *Xerocarpa avicenniaefoliola*. A supplement from the Buitenzorg herbarium will soon follow. [See Bot. Absts. 3, Entry 1830.]—*H. J. Lam.*

421. Lecomte, Henri. **Sapotacées recueillies à Madagascar par M. Perrier de la Bathie. [Sapotaceous plants collected in Madagascar by M. Perrier de la Bathie.]** Bull. Mus. Hist. Nat. [Paris] 25: 269–275. *3 fig.* 1919.—In addition to several species previously known the following species and varieties new to science were collected: *Sideroxylon Perrieri*, *S. Perrieri* var. *oblongifolium*, *S. saxorum*, *S. collinum*, and *S. madagascariense*.—*E. B. Payson.*

422. Lecomte, Henri. **Quelques Sapotacées Africaines. [Several African Sapotaceae.]** Bull. Mus. Hist. Nat. [Paris] 25: 189–193. *7 fig.* 1919.—The genus *Pachystela* is believed to contain two sections, *Eupachystela* and *Zeyherella*, which are here defined. The following new combination is made and new species described: *Pachystela Antunesii* (Engl.) H. Lec. (*Chrysophyllum Antunesii* Engl.) and *P. Pobeguiniana* Pierre.—*E. B. Payson.*

423. Lecomte, Henri. **À propos du genre Planchonella Pierre de la famille des Sapotacées. [In regard to the genus Planchonella Pierre of the family Sapotaceae.]** Bull. Mus. Hist. Nat. [Paris] 25: 123–125. 1919.—*Planchonella* is considered to be worthy only of sectional rank under the genus *Sideroxylon* but *Sersalisia* which is similar in fruit characters is held to be distinct from *Sideroxylon* for other reasons. The following new combination is suggested: *Sideroxylon racemosum* (*Planchonella racemosa* Pierre).—*E. B. Payson.*

424. Lecomte, Henri. **Un Labourdonnaisia nouveau (Sapotacées) de Madagascar. [A new Labourdonnaisia (Sapotaceae) from Madagascar.]** Bull. Mus. Hist. Nat. [Paris] 25: 53–55. 1919.—*Labourdonnaisia hexandra* is described as new to science and there is given a brief characterization of the other known species of this genus.—*E. B. Payson.*

425. Léveillé, H. **Souvenir de guerre. [War recollection.]** Bull. Geog. Bot. 1918: 143–145. 1918.—*Fumaria graminifolia*, *Anacyclus Duguei*, *Artemisia Duguei*, *Convolvulus Duguei*, and *Ornithogalum Duguei* are described as new species. *Ononis Natrix* L. var. *integrifolia* is described as a new variety. The forms new to science are described from southeastern Europe. The paper also includes a list of recognized phanerogamic species from the same region.—*J. R. Schramm.*

426. Long, Bayard. **Notes on the American occurrence of Crepis biennis.** Rhodora 21: 209–214. 1919.—See Bot. Absts. 4, Entry 347.

427. Long, Bayard. **The specific characters of Eragrostis peregrina and its two allies.** Rhodora 21: 133–140. 1919.—Hackel based his *Eragrostis pilosa* var. *condensa* upon a weed occurring in the Grand-Ducal Palace Garden at Karlsruhe. When K. M. Wiegand renamed this plant *E. peregrina* in 1917 he had material from eight stations. The writer has recently had a favorable opportunity to make a study of the characters of this same plant from several hundreds of specimens from more than fifty stations, which have accumulated at Philadelphia, having been collected in the surrounding country. He compares in considerable detail the characters of this species with those of its two closest allies, *E. pilosa* and *E. Purshii*, amplifying and reconsidering the characters advanced by above mentioned authors, and weighing their critical comments. The article is concluded by a summary of the distinguishing char-

acters of the three species. From his investigation the author states his belief that, while *E. peregrina* and *E. Purshii* are very definite species units, the material grouped under *E. pilosa* shows such an amount of variation as to give the strong suspicion that this is by no means a homogeneous series.—*James P. Poole.*

428. MARSHALL, E. S. **Notes on Somerset plants for 1918.** Jour. Botany 57: 147–154. 1919. [To be continued.]—This is a report of field work done in 1918 by the author and several other contributors. A long list of species and varieties is given, with new localities, and notes on interesting points.—*K. M. Wiegand.*

429. MEYER, RUD. **Echinopsis gigantea R. Mey. spec. nov.** Monatsschr. für Kakteenkunde 29: 58–59. 1919.—This was found in cultivation at Charlottenburg, the original country being unknown though probably Argentina. The species is compared with *E. valida* Monv.—*A. S. Hitchcock.*

430. MOORE, SPENCER LE M. **Alabastra diversa. Part XXX.** [Plantae Rogersianae. iv.] Jour. Botany 57: 160. 1919.—This instalment contains only a description of *Phyllanthus Rogersii* Hutchinson sp. nov., which was omitted from the treatment of *Phyllanthus*, where it should have appeared. It is a native of the Transvaal.—*K. M. Wiegand.*

431. NAKAI, TAKENOSHIN. **Notulae ad plantas Japoniae et Koreae XXI. [Notes on the plants of Japan and Korea, XXI.]** Bot. Mag. Tôkyô 33: 193–216. 1919.—This article contains notes and descriptions of new species, varieties and forms in the following genera: *Cephalotaxus, Torreya, Picea. Pinus, Populus, Cercidiphyllum, Pyrus, Viola, Eleagnus, Rhododendron, Sideroxylon, Viburnum, Patrinia* and *Mimulus.* New combinations and names are given for many plants.—*Roxana Stinchfield Ferris.*

432. NELSON, JAMES C. **The new genus Bromelica (Thurb.) Farwell.** Rhodora 21: 215–216. 1919.—The writer questions whether the characters taken by FARWELL in establishing the genus *Bromelica* (Rhodora 21: 76–78) are correct. He agrees that FARWELL's arguments in support of the new genus are convincing as long as the delimitation of the genus *Melica* is based on the characters taken by most American authors as distinctive, but believes that the problem of distinguishing *Melica* might be better solved, not by a separation of the genus, but by an attempt to find a different set of characters on which to base the delimitation. He points out that HACKEL, in his key to the *Festuceae* (in ENGLER and PRANTL, Nat. Pflanzenfam. ii. Abt. 2, p. 61–64), takes as the basis of his dichotomy (1) the presence of imperfect flowers on the upper part of the spikelet; (2) the number of such flowers, not their texture or arrangement. Using these as the distinguishing characters, *Bromelica* might still remain as a subgenus of *Melica*, but the nearest ally of *Melica* among American grasses would then be *Diarrhena* and not *Bromus* or *Festuca*. The delimiting characters of the American authors, namely, the texture and the arrangement of the upper lemmas, would then become characters of subgeneric rank.—*James P. Poole.*

433. OSTENFELD, C. H. **Contributions to West Australian botany, Part II.** Dansk Bot. Ark. $2^8$: 1–66. *26 fig., 6 pl.* 1918.—The first part, **Stray notes from the Tropical West Australia,** contains general remarks on the vegetation of Northwestern Australia with list of species collected during short visits. New species: *Abutilon flavum* and *Frankenia ambita.* The second part, **A Revision of the West Australian species of Triglochin, Crassula (Tillaea) and Frankenia,** describes three additional new species of *Frankenia*: *F. Maidenii, F. interioris* and *F. compacta.* The third part, **Chenopodiaceae from West Australia,** by OVE PAULSEN, lists 30 species, of which *Kochia Ostenfeldii, Arthrocnemum Benthami, A.* (?) *pruinosum* and *A. brachystachyum,* are new.—*A. Gundersen.*

434. PELLEGRIN, FRANÇOIS. **Un curieux Kapokier à fruits en sablier, Bombax buonopozense P. Beauv. var. Vuilletii Pellegrin. [A curious silk-cotton tree with fruits in the form of an hour-glass, Bombax buonopozense P. Beauv. var. Vuilletii Pellegrin.]** Bull. Mus. Hist.

Nat. [Paris] 25: 379–380. *1 fig.* 1919.—The author describes and illustrates a new variety of *Bombax buonopozense* P. Beauv. under the varietal name *Vuilletii*. Due to the strangling effect of the coriaceous, deciduous calyx, the fruits assume a form suggestive of an hour-glass. —*E. B. Payson.*

435. Pellegrin, François. **Polymorphisme des feuilles du Lierre commun au Portugal. [The polymorphism of the leaves of the common ivy of Portugal.]** Bull. Soc. Bot. Genève 10: 380–382. *1 pl.* 1918.—The leaves of the ivy collected in various parts of Portugal present a remarkable polymorphism. In spite of this variation, only one species, *Hedera Helix* L., is present.—*W. H. Emig.*

436. Pennell, Francis W. **Scrophulariaceae of the local flora. V.** Torreya 19: 235–242. 1919.—This final installment concludes the tribe *Buchnereae* with *Buchnera* (1 species), and adds the last tribe *Rhinantheae*, containing *Schwalbea* (1 species), *Castilleja* (1 species), *Rhinanthus* (1 species), *Pedicularis* (2 species) and *Melampyrum* (1 species, 1 variety). The notes on synonymy and distribution are continued. A list of local specimens of the author's collecting is appended, including 52 named forms. The name of the VIth tribe is corrected to read *Veroniceae*. [Previous installments have appeared in: Torreya 19: 107–119. *Ibid.* 142–152. *Ibid.* 161–171. *Ibid.* 205–216.]—*J. C. Nelson.*

437. Petch, T. **A new variety of Exacum zeylanicum Roxb.** Ann. Roy. Bot. Gard. Peradeniya 7: 43, 44. *Pl. 1.* 1919.—*Exacum zeylanicum* Roxb. var. *Lewisii* Petch is described, and the anthers of it and allied forms are figured.—*E. D. Merrill.*

438. Petch, T. **Alocasia indica Schott.** Ann. Roy. Bot. Gard. Peradeniya 7: 53–55. 1919.—The author shows that the Ceylon form recorded as *Alocasia indica* is really *A. macrorrhiza* Schott.—*E. D. Merrill.*

439. Petrie, D. **Descriptions of new native flowering plants.** Trans. and Proc. New Zealand Inst. 51: 106–107. 1919.—Describes *Lagenophora cuneata*, *Urtica aspera*, *Thelymitra caesia*, *Brachycome linearis*, new species.—*L. W. Riddle.*

440. Purpus, J. A. **Pachyphytum oviferum J. A. Purpus nov. spec.** Monatsschr. für Kakteenkunde 29: 100–103. *1 fig.* 1919.—The type was collected at Barranca Bagre near the San Rafaël mines, San Luis Potosí, Mexico, by J. A. Purpus in 1911.—*A. S. Hitchcock.*

441. Quisumbing y Arguelles, E. **Studies of Philippine bananas.** Philippine Agric. Rev. 12[2]: 1–73. *30 pl.* 1919.—Most of the varieties described originated outside of the Philippines, having been introduced within the past few years from tropical Asia, America, Malaya, and Polynesia. About 40 new varieties are described and figured, mostly referred to *Musa sapientum*, but one to *M. errans* and two to *M. paradisiaca*. Drawings of flowers and fruits, totaling 217 individual figures.—*E. D. Merrill.*

442. Rangachariar, K., and C. Tadulingham. **A note on certain species of Polygala.** Jour. Indian Bot. 1: 44–48. *4 fig.* 1919.—Four species of *Polygala* are considered, all obtained on the estate of the Agricultural College, Coimbatore, India, as follows: *Polygala sp.*, *P. Vahliana* DC., *P. bolbothrix* Dunn. and *P. chinensis* L. Of these *P. chinensis* is the only one included in Hooker's "Flora of British India," and in Gamble's "Madras Flora" only *P. chinensis* and *P. bolbothrix* are listed. The other two species are merged under *P. erioptera* DC. and *P. chinensis* L. Wight and Arnott, however, treated *P. Vahliana* DC. as a distinct species. Characterisations are given of the four species, and notes on the synonymy and relationships. *P. Vahliana* differs from its closest relative, *P. erioptera* DC., in its prostrate habit, oblong hairy leaves, villous sepal-wings, and pinkish petals. The second species will be given a name in a subsequent paper. It is closely related to *P. chinensis* L. and is the *P. arvensis* Willd. var. $\gamma$ of Wight and Arnott. *P. bolbothrix* is the *P. ciliata* (L.) of Wight and Arnott. The name *P. ciliata* had been used before by Linnaeus for a species of *Salomonia*.—*K. M. Wiegand.*

443. RYDBERG, PER AXEL. **Rosales, Family 24. Fabaceae, Tribe 6. Psoraleae.** North Amer. Flora 24: 1–64. 1919.—The tribe *Psoraleae*, as given, contains 19 genera, and 16 of these are covered in this part; the remainder will be discussed in a subsequent part. The genus *Eysenhardtia* is treated by FRANCIS W. PENNELL.—*H. M. Fitzpatrick.*

444. SCHODDE, DOROTHY E. **Polemoniaceae of Ohio.** Ohio Jour. Sci. 20: 43–47. 1919. —A key to the Polemoniaceae of Ohio is given and the following species are described: *Phlox maculata, P. paniculata, P. ovata, P. glaberrima, P. pilosa, P. divaricata, P. stolonifera, P. subulata, Gilia rubra., Polemonium caerulium, P. reptans, Cobaea scandens.*—*H. D. Hooker, Jr.*

445. SCHWANTES, G. **Mesembrianthemum Margaretae Schwantes spec. nov.** Monatsschr. für Kakteenkunde 29: 55–57. *1 fig.* 1919.—The species is formally described and notes are added as to its relationship. It belongs to the section *Cymbiformia* and is allied to *M. deserticolum.* The type was collected in German Southwest Africa by MARGARETHE FRIEDRICH.—*A. S. Hitchcock.*

446. SCHWANTES, G. **Mesembrianthemum prismaticum Marloth und Mesembrianthemum lapidiforme Marloth.** Monatsschr. für. Kakteenkunde 29: 42–45. *2 fig.* 1919.—This includes remarks and informal descriptions of the two species.—*A. S. Hitchcock.*

447. SEDGWICK, L. J. **On Trichodesma indicum R. Br. and Trichodesma amplexicaule Auctt.** Rec. Bot. Surv. India 6: 347–350. *Pl. 11.* 1919.—The two species are contrasted and the differential characters clearly indicated.—*E. D. Merrills.*

448. SEDGWICK, L. J. **A new Indian Impatiens.** Rec. Bot. Surv. India 6: 351. 1919.—*Impatiens kleiniformis* is described.—*E. D. Merril.*

449. SEDGWICK, L. J. **A new Indian Habenaria.** Rec. Bot. Surv. India 6: 352. 1919. —*Habenaria* (§*Ate*) *multicaudata* is described.—*E. D. Merrill.*

450. SEDGWICK, L. J. **On Alysicarpus rugosus DC. and its allied species.** Jour. Indian Bot. 1: 14–18. 1919.—Various authors have treated the species of this genus of the Leguminosae with deeply and closely transversely rugose joints of the loment as one or several species. DE CANDOLLE gave two species; WIGHT and ARNOTT, three species; while BAKER reduced them all to a single variable type. Later floras have mostly followed BAKER. The author is convinced that at least four species exist, namely: *A. styricifolius* DC., *A. Heyneanus* Wt. & Arn., *A. rugosus* DC., and *A. ludens* Wall. (probably sp.). This has been learned through field work in western India, where these plants are very abundant. In this region there were two types differing in at least six characters and they did not intergrade. If this was one species the contrasting characters must be allelomorphs. The method of fertilization was not observed, but is probably cross fertilization; two separate types are assumed, each with all the contrasting characters but without a single heterozygote plant even in one class of characters should be impossible. Even if self-fertilized the constancy of characters would convince one that two species were concerned. Much of the difficulty with the taxonomy of *Alysicarpus* lies in the extreme plasticity of the species in their reactions toward environment. Descriptions of the species are given, also list of specimens examined. The material is all from western India collected by FATHER BLATTER, MESSRS. HALLBERG AND BELL, and the author. The treatment is tentative awaiting more complete study, especially of the intricate synonymy.—*K. M. Wiegand.*

451. SMALL, JAMES. **The origin and development of the Compositae.** New Phytol. 18: 129–176. *Fig. 64–78.* 1919.—[See Bot. Absts. 5, Entry 720; also next following Entry, 452.]

452. SMALL, JAMES. **The origin and development of the Compositae.** New Phytol. 18: 201–234. *Fig. 79.* 1919.—"The results of the present investigation of the Compositae are chiefly of two kinds; the phylesis of the family and of its chief groups has been elucidated, and various theories have been given to account for the origin and development of the struc-

tures and physiological and cytological phenomena which occur in the family." The general conclusions reached in previous chapters are here summarized in convenient form. The phyletic results are next brought together. The family history is given, tribe by tribe, in complete and positive fashion. The conclusions are based in part on paleontology and geographical distribution, but more largely on comparative anatomy. In the concluding chapter an attempt is made to give, on the basis of an elaborate family tree, a "coherent account of the evolution of the family" based on "modern theories of heredity, evolution and geographical distribution." Step by step, from the Cretaceous to the Pliocene, the origin and differentiation of the tribes and genera in time and space are given in an "attempt to bring a real, living picture of the origin and development of the Compositae before the mind of the ordinary student." [See next preceding Entry, 451.]—*I. F. Lewis.*

453. SMITH, CHARLES PIPER. **Studies in the genus Lupinus—IV. The Pusilli.** Bull. Torrey Bot. Club. **46**: 389–410 *Fig. 43–52.* 1919.—The following published names are considered in this paper: *L. pusillus* Pursh, *L. brevicaulis* Wats., *L. Kingii* Wats., *L. Sileri* Wats., *L. Shockleyi* Wats., *L. capitatus* Greene, *L. odoratus* Heller, *L. scaposus* Rydberg, *L. rubens* Rydberg, *L. dispersus* Heller, *L. flavoculatus* Heller, *L. intermontanus* Heller, and *L. argillaceus* Woot. & Standl. The following new combinations are made: *L. Kingii argillaceus* (Woot. & Standl.), *L. rubens flavoculatus* (Heller), *L. pusillus intermontanus* (Heller). *L. odoratus* Heller var. *pilosellus* is described as a new variety.—*P. A. Munz.*

454. SMITH, J. J. **Index Orchidacearum quae anno 1919 in Horto Botanico Bogoriensi coluntur. [Index of the orchids grown during the year 1919 in the Buitenzorg Botanical Garden.]** Bull. Jard. Bot. Buitenzorg III, 1: 91–126. 1919.—See Bot. Absts. 4, Entry 875.

455. STANDLEY, P. C. **Two new species of plants from Cuba.** Proc. Biol. Soc. Washington [D. C.] 32: 241–242. 1919.—*Achyranthes crassifolia* Standl., and *Torrubia insularis* Standl. are described as new species from Cuba.—*J. C. Gilman.*

456. ST. JOHN, HAROLD. **Two color forms of Lobelia cardinalis L.** Rhodora 21: 217–218. 1919.—A brief account of some of the recorded occurrences of the rose-colored form of *Lobelia cardinalis* L. For this form the writer proposes the name *L. cardinalis* L., f. *rosea* n. f. The albino form of the same species is designated as *L. cardinalis* L., f. *alba* (A. Eaton) n. comb., and the synonyms are given.—*James P. Poole.*

457. THOMPSON, H. S. **Carex montana L.** Jour. Botany 57: 274–275. 1919.—Notes are given on the discovery and occurrence of this rare sedge on the Mendip plateau in England. The peculiar yellow-green foliage is mentioned as a means of quick identification in the field. It flowers early and the fruits are soon shed. This, together with the fact that many plants do not flower, is the whole cause of its tardy discovery in Mendip, where it was not found until 1890.—*K. M. Wiegand.*

458. THOMPSON, H. STUART. **The genus Euphrasia and E. minima.** Jour. Botany 57: 335–337. 1919.—Attention is called to a paper by JOHN BALL (Jour. Botany 11: 272. 1873), which seems to have been overlooked by recent writers on *Euphrasia*. BALL, like TOWNSEND formerly, expressed his doubt of there being many species of *Euphrasia* rather than one polymorphic species. Conditions in the British Isles are not opposed to this interpretation, but on the continent the forms are more diverse. BALL noted that one form, *E. minima*, is more distinct than others, and is probably ancient, as it occurs on widely separated mountain tops. The author finds *E. minima* one of seventy plants having the greatest vertical range in the western Alps. He is still skeptical of the occurrence of *E. minima* in Britain. *Euphrasia* is an interesting genus in which to study the course of evolution and distribution, and much can be learned from it. We should not forget the suggestion of BALL that insect visitors play an important part in the polymorphism of the genus. No seeds of *Euphrasia* have been found in glacial beds, though those of the allied *Bartsia* have been so found. The distinguishing features of *Euphrasia* and related genera have been recently ably stated and illustrated by BEAUVERD (Bull. Soc. Bot. Genève 3. 1911).—*K. M. Wiegand.*

459. Van den Heede, A. **Une superbe plante annuelle.** [A superb annual plant.] Rev. Hortic. [Paris] 91: 393. 1919.—See Bot. Absts. 5, Entry 1839.

460. Vaupel, F. **Echinocactus Mihanovichii Fr. et G.** Monatsschr. für Kakteenkunde 29: 66. *1 fig.* 1919.

461. Weatherby, C. A. **Further notes on Impatiens biflora.** Rhodora 21: 98–100. *6 fig.* 1919.—The writer published the name *Impatiens biflora* forma *Peasei* (Rhodora 19: 116. 1917) without having seen the living material, drawing up the description from the reports of the collectors and from statements on herbarium labels. All agreed in describing the flowers as "pink" or "roseate," while the flowers on certain herbarium specimens showed traces of pink coloration. On later examination of the living plants from the type station and two other localities in the White Mountains, he found that the ground color of the flowers of this form is cream, the impression of a pink blossom being due to very numerous pink spots coalescent into solid patches of pink, confined to the inner surface of the spreading perianth parts. This form is then, essentially, only a phase of *f. albiflora* but is allowed to stand, pending further investigation, in view of its undoubtedly striking appearance and its segregation into pure colonies. Its description should, however, be amended to read: "Perianth cream colored, the pink spots numerous and coalescent, on the inner surfaces of the spreading perianth parts, into patches of solid pink. *Impatiens biflora*, forma *platymeris*, f. nov. In the typical *I. biflora* the petals are unequally two lobed on the outer edge, the basal lobe being small, about one half the size of the dilated apical lobe. In the new form the basal lobe is as large as the apical, or even slightly larger, and often slightly overlaps it, giving the flower the appearance of being partially doubled. The difference is illustrated by sketches. The type station is at Southbury, Connecticut, where eight plants were found intermingled with the typical form.—*James P. Poole.*

462. Weingart, W. **Cereus Langlassei Web.** Monatsschr. für Kakteenkunde 29: 105–106.1 919.—The author gives notes on the species at the Dahlem Bot. Gard.—*A. S. Hitchcock.*

463. Weingart, Wilh. **Cereus ruber Weing.** Monatsschr. für Kakteenkunde 29: 57–58. 1919.—The author shows this to be the same as *C. Schrankii* Zucc.—*A. S. Hitchcock.*

464. Weingart, W. **Cereus Jusbertii Reb.** Monatsschr. für Kakteenkunde 29: 72. 1919.—This is thought to be a hybrid between *Echinopsis* and *Cereus.*—*A. S. Hitchcock.*

465. Wernham, H. F. **Rubiaceae Batesianae.—I.** Jour. Botany 57: 275–283. 1919.—This paper is based on a collection of about 250 specimens made by G. L. Bates in the Yaunde district of Southern Cameroons, and sent to the British National Herbarium. Of them over sixteen per cent were *Rubiaceae.* A lengthy quotation from Bates' notes is included picturing the ecological conditions in certain portions of the region. Nearly all plants are woody and fully half have weak climbing stems. The partial clearings of the natives revert gradually to forest. There is no winter and no regular time of flowering of each species, still Bates thinks some regularity might be made out with study. Twenty-six species and varieties are listed in this installment. References to published accounts, notes on standard characteristics, on distribution, and on habit and classification are given. The following new species are described: *Mussaenda bityensis, Mussaenda leptantha, Sabicca Amomi, Bertiera* (§ *Capitatae*) *bityensis, Randia* (§ *Euclinia*) *megalostigma, Amaralia palustris, A. ekotokicola,* and *Morinda Batesii.* The following new combination is made: *Cephaelis hexamera* (K. Schum) Wernham (*Uragoga hexamera* K. Schum).—*K. M. Wiegand.*

466. Wernham, H. F. **Rubiaceae Batesianae—II.** Jour. Botany 57: 342–347. 1919. [Continued from Jour. Botany 57: 275–283.]—The paper contains the descriptions of eight new species and notes on *Tarenna eketensis* Wernh. The new species are as follows: *Gardenia nigrificans, Oxyanthus heptactina, Atractogyne Batesii, Pavetta antennifera, Rutidea Batesii, R. pavelloides, R. tarennoides,* and *R. Dorothea.*—*K. M. Wiegand.*

467. Woodward, R. W. **Further notes on Philotria.** Rhodora 21: 218–219. 1919.—See Bot. Absts. 5, Entry 590.

# MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. Livingston, *Editor*

468. A., B. C. [Rev. of: Winterbottom, D. C. **Potash—an investigation into its economic sources in South Australia, etc.** Dept. Chem. South Australia Bull. 2. *34 p.* 1916.] New Zealand Jour. Sci. and Tech. 1: 124–126. March, 1918.—Under "*Potash from plants,*" author gives analysis of a number of substances examined in laboratory of his department, from which it appears that the woods of various species of *Eucalyptus* yield an ash which may contain from 1.25 to 5.20 per cent of potash He concludes from his analysis of various garden plants, bracken fern, etc., that the plant life of Australia has generally a lower potash content than that of European countries. The following Australian seaweeds were examined and found to have percentage of potash contents as indicated:—*Posidonia australis*, 0.6; *Macrocystis* (Keep), 6.0; *Echlonia radiata*, 10.0; *Seriococeus axillaris*, 10.2.—The last two samples contained an appreciable quantity of iodine. *Macrocystis pyrifera* is abundant along rocky coasts of New Zealand. *Ecklonia radiata* is common along shores of North and South islands of New Zealand. Reports also on derivation of potash from wool, and the recovery and purification of wool-fat from the wool-scouring process.—*S. S. Gager.*

469. B., L. [Rev. of: Smart, B. J., and P. Pecover. **Investigations regarding heat-insulating materials.** Commonwealth Engineer 5: 127–132. Dec., 1917.] New Zealand Jour. Sci. and Tech. 1: 186–187. May, 1918. Gives quantitative data concerning marine fiber (*Posidonia australis*) and other plant and mineral products and substances. [See also Bot. Absts. 6, Entry 472.]—*C. S. Gager.*

470. Hickey, J. P. **The diagnosis of the more common helminthic diseases of man.** Public Health Reports [U. S. A.] 35: 1383–1400. 1920.—Refers to the necessity of distinguishing spores of cryptogams from eggs of helminths in the examination of stools and gives some specific details.—*C. E. Fairman.*

471. Holste, G. [Rev. of: Bücher, H. **Die Heuschreckenplage und ihre Bekämpfung. (Combating the locust plague.)** Zeitschr. angew. Entomol. (Supplem. 3). 1918.] Forstwiss. Centralbl. 41: 336–338. 1919.—Plagues of the native locust (*Stauronotus maroccanus*) in western Anatolia, and of the African locust (*Schizocerca peregrina*) in Palestine and Syria seriously threatened the crops of those regions during the war. German scientists were called in to assist in checking the damage, and finally succeeded by trapping the locusts in ditches dug along a wall of zinc plates 30 cm. high.—*W. N. Sparhawk.*

472. J., S. H. [Rev. of: Winterbottom, D. C. **Marine fibre.** Dept. Chem. South Australia Bull. 4. *30 p.* 1917.] New Zealand Jour. Sci. and Tech. 1: 127. March, 1918.—Author records beds of *Posidonia australis* (a marine spermatophyte) averaging about 10 ft. deep. There are in sight nearly 5,000,000 tons that can be sold profitably at £25 per ton. Reviewer states that he has used *Posidonia* very successfully as a heat-insulating material in refrigeration, with better results than with slag wool, pumice, hairfelt, boiled paper, and various sawdusts. The material is recommended also for boiler and pipe covering. [See also Bot. Absts. 6, Entry 469.]—*C. S. Gager.*

473. Sanderson, T. **The bread value of wheat.** North Dakota Agric. Exp. Sta. Bull. 137. *45 p.* 1920.—The author presents certain baking coefficients devised by him to be applied to the value of the milled flour. These are concerned with water absorption of flour and volume, color and texture of loaf. The value of the flour being fixed by these various factors, the market value of the wheat becomes fixed in turn. Using the standards given, the author finds that the wheat values thus secured are not correlated at all with the commercial values which the trade assigns to the federal grades. In fact, the author states that some of the lowest commercial grades of wheat really had as high milling and baking values as the higher grades of wheat, in certain seasons. The author states that if the proposed coefficients are fair, it follows that the money loss to the farmers through the present system of wheat marketing is very great.—*L. R. Waldron.*

# BOTANICAL ABSTRACTS

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ENTRIES 474–878

## AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

474. ANONYMOUS. **Betaenkning fra det Kgl. Danske Landhusholdningsselskab.** [**Thoughts from the Royal Danish Agricultural Society.**] Tidsskr. Landokonomi (Kjöbenhavn) 1920[2]: 49–80. 1920.—This discussion deals in part with irrigation problems in Denmark, where irrigation has rarely been attempted. A few farmers have recently constructed tanks into which water is pumped for use in irrigating small areas. Thus far these attempts are merely experimental.—*Albert A. Hansen.*

475. BEATH, O. A. **Poisonous plants.** Proc. Soc. Promotion Agric. Sci. 39: 39–47. 1919. —Poisonous plants are responsible for the loss of considerable numbers of live stock. In Wyoming the loss of sheep from this cause is estimated at 14 per cent. The principal poisonous plants may be placed in two groups: those that occur rather generally distributed and in large numbers in several states, as the locos (*Oxytropis* and *Astragalus*), larkspurs (*Delphinium*), death-camus (*Zigadenus*), water hemlock (*Cicuta*), vetches (*Astragalus*), lupines (*Lupinus*), and aconites (*Aconitum*). In the other group are those that occur only in restricted areas and often only as single plants, as laurels, ferns, milkweeds (*Asclepias verticillata*), Woody aster (*Xylorrhiza parryi*), western sneeze weed (*Dugaldia hoopesii*), wild cherry and oaks. The author suggests as methods of control: (1) education of stockmen to recognize poisonous plants, (2) a complete poisonous plant survey for each western state, (3) discontinuance of practice of trailing sheep long distances to bedding pens, (4) ample supplies of salt for the stock, (5) the commercial exploitation of poisonous plants for medicinal purposes, thus reducing their number.—*H. N. Vinall.*

476. COCKAYNE, L. **The importance of plant ecology with regard to agriculture.** New Zealand Jour. Sci. Tech. 1: 70–74. 1918.

477. DUDDLESTON, B. H. **The modified rag doll and germinator box.** Purdue Univ. Agric. Exp. Sta. Bull. 236. *12 p. 7 fig.* 1920.—The modified rag doll for testing seed corn recommended in this bulletin is very simple in construction. It consists of a sheet of cloth of suitable size placed upon a sheet of heavy paper slightly longer. The heavy paper serves as an insulator to prevent molds from permeating the cloth and thereby rotting many of the seedlings. The seeds from each ear are separated and when they carry rot-producing organisms they can be easily noted and the seed ears represented by them can be discarded. The

germinator box serves to keep the dolls in proper position and thoroughly moist. This method of testing seed corn is well suited for community testing. Results of a test on a large scale at Shelbyville, Indiana, in 1920 show an average of 35 per cent of infected seed ears.—*G. N. Hoffer.*

478. Espino, Rafael B. **A review of the maize investigations at the College of Agriculture.** Philippine Agric. 8: 191–197. 1919.—An epitome of the maize investigation completed by the Philippine College of Agriculture and a bibliography of the same.—*C. V. Piper.*

479. Fisher M. L. **More study of pastures and pasturing needed.** Proc. Soc. Promotion Agric. Sci. 39: 19–21. 1919.—"Inasmuch as pasturage is so important in live stock farming it is rather strange that so little has been done in an experimental way with pastures and pasturing." To remedy this situation, experiments covering the adaptation of plants to soils, seed bed preparation, single or mixed seedlings, fertilization, carrying capacity of pastures, continuous or alternate grazing, improvement of grass seeds and breeding of better plants are suggested.—*Lyman Carrier.*

480. Harris, J. Arthur. **Practical universality of field heterogeneity as a factor influencing plot yields.** Jour. Agric. Res. 19: 279–314. 1920.—Heterogeneity is the difference in capacity for crop production, throughout a field of such magnitude as to influence in like manner, but not necessarily in like degree, the yield of adjacent small plots. Experimental data from many published sources are analyzed statistically to determine the extent to which heterogeneity of experimental fields may influence plot yields. The results of the analysis show that in every field the irregularities of the substratum have been sufficient to influence, often profoundly, the experimental results.—Analysis of data on physical and chemical requisites for plant growth show that the coefficients for water content and for chemical composition of soil are of about the same order as those found for crop yields and "while these results do not prove that the heterogeneity of experimental fields in their capacity for crop production is directly due to these and other physical and chemical factors, there can be little doubt that this is actually the case." Greater care in technic and more extensive use of the statistical method in analysis of plot experimentation are recommended.—*D. Reddick.*

481. Hertel, H. **Landbruget i 1919. [Agriculture in 1919.]** Tidsskr. Landokonomi (Kjöbenhavn) 1920[1]: 1–36. 1920.—During the month of May, 1919, various species of insects attacked the small grains. Sandfleas were particularly bad on barley, but since the infestation did not last long the damage was not severe. The green fly larvae did considerable damage to oats in late sown fields. Grain lice attacked barley and oats, but rain and cool weather seemed to stop damage from this source. During the year 1919 the fields seemed unusually free of weeds. During August and September cabbage worms and cabbage lice caused considerable damage to cabbages and turnips.—*Albert A. Hansen.*

482. Hoffer, G. N. **Disease-free sweet corn seed.** Purdue Univ. Agric. Exp. Sta. Bull. 233. *12 p., fig. 1–8.* 1920.—See Bot. Absts. 6, Entry 1271.

483. Maiden, J. H. **Chats about the prickly pear. No. 4.** Agric. Gaz. New South Wales 31: 407–412. 1920.—Presents a résumé of results in the feeding of *Opuntia* spp. in Australia, in the United States and in India.—*L. R. Waldron.*

484. McGovern, J. A. **Wheat grading for schools.** North Dakota Agric. Exp. Sta. Ext. Div. Circ. 36. *8 p. 5 fig.* 1920.—An illustrated description of wheat grading for instruction in the public schools, as required by the state law.—*C. V. Piper.*

485. McKenzie, R. T. **Agriculture in Denmark.** Jour. Dept. Agric. Victoria 18: 140–149. 1920.—General conditions described.—*J. J. Skinner.*

486. Mendiola, Nemesio B. **A review of the rice investigations at the College of Agriculture.** Philippine Agric. 8: 145–160. 1919.—A résumé and bibliography of the rice investigations by the Philippine College of Agriculture.—*C. V. Piper.*

487. Osborn, Herbert. **The problem of permanent pasture, with special reference to the biological factors.** Proc. Soc. Promotion Agric. Sci. 39: 7–18. 1919.—Emphasis is placed on the importance of pastures and statistics are given showing the comparative areas of pastures and meadows. Attention is also directed to the extremely meager experimental data on pasture management and the desirability of comprehensive experiments to guide the stockman in the proper utilization of his grazing lands. The complex nature of the pasture problem involving the various branches of biological science leads the writer to suggest that it "merits the attention of some broad organization and that it should be so organized as to secure the cooperation of technically trained men in the various scientific branches concerned." Such an organization it is stated "would certainly secure more important results and in much less time and with far less expense than can ever be hoped for in disjointed and fragmentary studies in different phases of the problem, even if taken up by many different workers and in many different states."—*Lyman Carrier.*

488. Roxas, Manuel L. **Sugar cane investigations at the College of Agriculture.** Philippine Agric. 8: 179–189. 1919.—A digest of sugar cane studies at the Philippine College of Agriculture, together with a bibliography.—*C. V. Piper.*

489. Ruffer, Sir Arnold. **Food in Egypte.** Mem. Inst. Egypte 1. *86 p.* 1919.

490. Temple, A. J. **Canadian wonder beans.** Jour. Dept. Agric. Victoria 18: 175–177. 1920.—Conditions suitable for growing beans in Victoria are described and cultural methods given.—*J. J. Skinner.*

491. Waldron, L. R. **Annual hay and forage crops.** North Dakota Agric. Exp. Sta. Ext. Div. Circ. 37. *8 p., 1 fig.* 1920.—Discusses briefly culture and utilization of foxtail millets, proso (*Panicum miliaceum*), Sudan grass, maize, oats, barley, field peas, sunflowers, Russian thistle, rape, sweet clover, rye and sorghums.—*C. V. Piper.*

492. Wenholz, H. **The utilization of reclaimed swamp land.** Agric. Gaz. New South Wales 31: 401–405. 1920.—Deals in part with suitable pasture plants and with crops and fertilizers.—*L. R. Waldron.*

493. Wiancko, A. T., and C. O. Cromer. **Soybeans in Indiana.** Purdue Univ. Agric. Exp. Sta. Bull. 238. *16 p., 8 fig.* 1920.—Because of their high feeding quality and beneficial effect on succeeding crops, the growing of soybeans is highly recommended to Indiana farmers. Soybeans may be used as a substitute for clover, in case of failure of this crop. As a regular rotation crop soybeans should follow corn. Where wheat followed soybeans, yields were increased 6¼ bushels per acre. Directions are given for soil preparation, fertilization, seed inoculation, cultivation, harvesting and threshing. Results of tests on method and rate of planting and on variety yields are presented.—*Max W. Gardner.*

## BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Alfred Gundersen, *Assistant Editor*

494. A., J. C. [Rev. of: Cockayne, L. **New Zealand plants and their story.** New Zealand Board of Science and Art, Manual No. 1. *xvi + 248 p.* Wellington, New Zealand, 1919.] New Zealand Jour. Sci. Tech. 2: 407-409. 1919.

495. Anonymous. **The New Zealand Institute Science Congress, Christ Church, 1919.** New Zealand Jour. Sci. Tech. 2: 226–230. 1919.

496. Briquet, J. **Rapport sur l'activité au Conservatoire et au Jardin Botanique de Genève pendant les années 1916, 1917, et 1918. [Report on the Conservatory and Botanical Garden of Geneva for 1916, 1917 and 1918.]** Ann. Conservatoire et Jard. Bot. Genève **20:** 479–509. 1919. —The report gives a classified account of the collections received at the Delessert Herbarium and a list of the publications based on the collections at the Herbarium. There are also notes on the "Iconothèque" or collection of portraits, the botanical museum, and the botanical garden.—*A. S. Hitchcock.*

497. Brown, J. G. **A new text book of botany.** [Rev. of: Martin, J. N. **Botany for agricultural students.** John Wiley and Sons: New York, 1919.] Plant World **22:** 217. 1919.

498. C., C. A. [Rev. of: anonymous. **Plan of Tongariro National Park, [2 miles = 1 in.]** Lands and Survey Dept., Wellington, New Zealand, 1917.] New Zealand Jour. Sci. Tech. **1:** 191. May, 1918.

499. Checkley, George. **The formation of a students' botanical garden.** Pharm. Jour. **104:** 44. 1920.—See Bot. Absts. 6, Entry 1298.

500. Densmore, Hiram D. **General botany for universities and colleges.** *xii + 459 p., 289 fig.* Ginn & Co.: Boston, 1920.—Part I, Biology of the higher seed plants, contains eleven chapters, arranged in four sections as follows: (1) Plants and the environment, (2) Cell structure and anatomy, (3) Physiology, (4) Reproduction. Chapters X and XI are entitled, "Plant breeding and evolution," and "Historical development of botany and the biological sciences." Part II comprises six chapters on the great groups of plants, and Part III five chapters on "Representative families and species of the spring flora."—*C. S. Gager.*

501. Forbes, R. D. **Specialization vs. generalization in forestry education.** Jour. Forestry **18:** 383–390. 1920.—Training in forestry has gone too far in specialization, the great need being for men with training along broad lines. Economics, public speaking, psychology and other cultural courses are recommended.—*E. N. Munns.*

502. Gager, C. Stuart. **Ninth annual report of the Brooklyn Botanic Garden, 1919.** Brooklyn Bot. Gard. Record **9:** 29–89. Apr., 1920.—Contains also the annual reports of the heads of departments of the Garden.

503. Grier, N. M. **The range of information in biology. III Botany.** Jour. Educat. Psychol. **10:** 509–16. 1919.—Nature study tends to include more botany. A hundred words relating to plants were given to high school pupils, who were asked to define or explain them, or state if familiar or new. It appears that botany has better basis on which to build than physiology or zoology, and should not be excluded from curriculum.—*A. Gundersen.*

504. Michael, Ellis L. **Marine ecology and the coefficient of association. A plea in behalf of quantitative biology.** Jour. Ecol. **8:** 54–59. 1920.

505. Petrie, D. **The need of a comprehensive Dominion herbarium.** New Zealand Jour. Sci. Tech. **2:** 260–262. July, 1919.—Recommends that the Dominion government "should without delay set about creating a comprehensive Domionon Herbarium, and appoint for its management an expert director of Plant Research . . . . A good garden, not so much for the display of floral richness as for practical economic purposes, will be an indispensable appendage to any worthy herbarium today." Besides the more conmmonly recognized functions of a national herbarium, author adds, "inquiries into the uses and the diseases of plants of economic importance, and the investigation of other questions of biological significance." Urges also the founding of a comprehensive plant museum for the Dominion.—*C. S. Gager.*

506. Thomson, J. A. **Proposals for a Dominion scheme of libraries of science and technology.** New Zealand Jour. Sci. Tech. **2:** 353–365. 1919.

507. T[homson], J. A. [Rev. of: Fleming, A. P. M. **Industrial research in the United States of America. No. 1.** *60 p., 85 pl.* London, 1917.] New Zealand Jour. Sci. Tech. 1: 122–124. March, 1918.

508. T[homson], J. A. [Rev. of: Hogben, G., and J. A. Thomson. **Report on the organization of scientific and industrial research.** New Zealand Parl. Paper H, 47. *9 p.* 1917.] New Zealand Jour. Sci. Tech. 1: 120–122. March, 1918.

509. W., L. J. [Rev. of: **Agricultural research in Australia.** Commonwealth of Australia Advisory Council of Science and Industry. Bull. 7. Melbourne, 1918.] New Zealand Jour. Sci. Tech. 2: 155–157. March, 1919.—Official report of the proceedings at a conference of agricultural scientists held in Melbourne in November, 1918, under auspices of Advisory Council.

510. Wells, Morris M. **The relation of ecology to high school biology.** School Sci. Math. 18: 439–446. May, 1918.—See Bot. Absts. 4, Entry 384.

## FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*

J. V. Hofmann, *Assistant Editor*

511. Anonymous. **Der Haushalt der preussischen Forst- und Landwirtschaftlichen Verwaltung für das Rechnungsjahr 1919. [Financial statement of the Prussian Department of Forests and Agriculture, fiscal year 1919.]** Forstwiss. Centralbl. 41: 327–332. 1919.—Total income of the forest administration was 263,301,000 marks, or 68,440,000 marks more than in 1918. 240,000,000 marks was received for timber, an increase of 65,000,000 over 1918, due to increased quantities sold. Other income was from by-products (resin, etc.), 15,000,000, hunting, 1,250,000, and miscellaneous 7,051,000 marks. Total expenses were 87,916,000 marks, or 11,085,000 more than in 1918. These included salaries, 17,816,400 marks, costs of cutting and transporting timber, 35,000,000 marks, and various other costs of administration, improvements, pensions, and the like. The total area of State forests was 3,052,092 hectares, 13 hectares more than in 1918. Of this, 2,728,868 hectares are productive forest. Total yield of wood is estimated at 11,351,749 cubic meters. The personnel numbers 6509, including 744 Oberförster ("Supervisors") in charge of forests and 3965 Revierförster and Förster ("Rangers") in charge of districts.—*W. N. Sparhawk.*

512. Anonymous. **Die Brautigamspflanzung auf Alsen. [The bridegrooms' plantation on Alsen.]** Des Försters Feierabende [Supplement to Deutsch. Forstzeitg. 35] no. 35. 1920.—An old custom required every man on Alsen Island, before his marriage, to plant ten young oaks or fifteen beeches, or pay a fine. Hence the name for the oak and beech woods.—*W. N. Sparhawk.*

513. Anonymous. **Die Forderung des Anbaus von Korbweiden. [Encouraging the production of basket willows.]** Deutsch. Forstzeitg. 35: 175. 1920.—With the shortage of foreign raw material the basket industry is in sore straits. The chief sufferers are the war-injured and other economic weaklings. It is necessary to utilize all existing willow holts and to develop new ones in every suitable place.—*W. N. Sparhawk.*

514. Anonymous. **Die neue Dienstanweisung für die preussischen Staatsförster. [New service instructions for Prussian state foresters.]** Forstwiss. Centralbl. 41: 464-473. 1919. —Gives in detail the duties of local forest field officers, effective October 1, 1919.—*W. N. Sparhawk.*

515. Anonymous. **Eine Verordnung über die Einschränkung der Kahlschlage in den nichtstaatlichen Waldungen. [Ordinance concerning restriction of clearing in forest not belonging to the state.]** Deutsch. Forstzeitg. 35: 193–194. 1920.—Before the war Germany was a heavy importer of wood, but now most imports have been cut off, due to the worldwide shortage of wood and to the high prices and unfavorable rate of exchange. Moreover, large areas of forests have been lost to Germany as a result of the war. The scarcity of fuel has resulted in enormous demand for firewood, which further reduces the production of building material in German forests. The same conditions that hinder imports favor exporting of wood, and a considerable illicit trade is carried on across the border. The net result of these factors is a tendency to destroy large areas of private forests for immediate profit. The central government has proposed a decree forbidding clear cutting, or cutting which leaves less than one-fourth of the normal stand, on any area of more than 0.5 hectare in other than state forests, except with permit from designated authorities. Such permission may be withheld in case the proposed cutting endangers the given stand or neighboring ones, through formation of torrents, shifting sands, or exposure to wind, or if the stand to be cut is at a period in its growth where considerable loss in volume production would result from it cutting, or if a continuous supply of wood for the local population and industries would be threatened, or if reforestation would be made difficult. A sufficient sum to carry out reforestation measures must be deposited with proper authorities. Penalties for violation are set at from 1000 to 10,000 marks per hectare, unless local laws prescribe higher ones.—*W. N. Sparhawk.*

516. Anonymous. **Ergänzende Anweisung zur "Anweisung zur Ausführung der Betriebsregelungen in den Preussischen Staatsforsten vom 17 März, 1912," bis 12 März, 1919. [Supplementary instructions for management of Prussian state forests.]** Forstwiss. Centralbl. 41: 310–317. 1919.—Due to heavy cutting in the state forests, and especially in young stands, during the war, certain changes in management are necessary. Most important is to shorten the rotation period. An average rotation of 100 years is set for pine and, in general, also for spruce. Since it will be necessary to produce high grade large timber, common timber, and mine timber and pulpwood, the stands will be managed on three different rotations, depending on the particular stands in each case, of 120 years, 100 years, and 60 years, in about the proportion 2:3:1 (making the average 100). For hardwoods the former rotations will generally be used. In case of the younger stands, decision as to the rotation to be used can be deferred until they are older. As a basis for planning the regulation, an age-class survey and map must be made. For this purpose the forests are to be classified in four main types, according to the predominating species: oak; beech-ash-maple; birch-alder; and fir-spruce-pine. Other instructions relate to changes in the working plan and cutting budget.—*W. N. Sparhawk.*

517. Anonymous. **Gegen die Zwangsbewirtschaftung des Eichengerbholzes. [Against compulsory utilization of oak tanning-extract wood.]** Deutsch. Forstzeitg. 35: 194. 1920.—The wood committee of the imperial forestry council has decided against compulsory utilization of oak extract-wood and tanbark, but urges all forest owners to keep in mind the need of the German leather industry for such material.—*W. N. Sparhawk.*

518. Anonymous. **Milderung der Brennholznot im nächsten Winter. [Relief of fuel shortage for next winter.]** Deutsch. Forstzeitg. 35: 194. 1920.—Fuel shortage will probably be as acute next winter as in the one just past, especially since much wood as would ordinarily be available for fuel will be taken for mine timbers, paper pulp, and ties. Coal production must be increased and stumps and peat must be utilized as far as possible.—*W. N. Sparhawk.*

519. Anonymous. **Neuregelung der Jagdnutzung in den preussischen Staatsforsten. [New regulations governing hunting in Prussian state forests.]** Forstwiss. Centralbl. 41: 449–464. 1919.—Gives in considerable detail the new regulations effective October 1, 1919. The policy has been adopted of keeping the hunt under control of the forest administration, except in exceptional cases where it may be leased.—*W. N. Sparhawk.*

520. Anonymous. **Note on sal sowings in the western Dooars.** Indian Forester 46: 297–303. *1 fig.* 1920.—Results of experimental seed sowing of sal in India show that the work must be done in the open and that the competition of the native grasses must be kept down. Planting with *Tephrosia* is advocated as a measure of insuring slight competition, green manuring and protection. Grass fires set the plantations back about three years and animals do considerable damage.—*E. N. Munns.*

521. Anonymous. [Rev. of: Hargreaves, W. A. **An investigation into the prospects of establishing a paper making industry in South Australia.** Dept. Chem. South Australia Bull. 1. *56 p.* Adelaide 1916.] New Zealand Jour. Sci. Tech. 1: 60. 1918.—Australia is said to be the largest consumer of paper in the world, per capita of population, and South Australia is entirely dependent upon outside sources for supplies of both paper and mill-board. There are four mills in Victoria. Besides the manufacture of paper from straw, the article also deals fully with the manufacture of straw boards, and in both cases the estimated costs of manufacture are detailed in full.—*C. S. Gager.*

522. Anonymous. [Rev. of: Pool, Raymond J. **Handbook of Nebraska trees.** Nebraska Conserv. and Soil Surv. Bull. 7. Lincoln, Nebraska, 1919.] Jour. Forestry 18: 424–426. 1920.

523. Anonymous. **Waldverwüstung in der Umgebung von Wien. [Forest devastation around Vienna.]** Deutsch. Forstzeitg. 35: 42. 1920.—Although cutting of marked trees is permitted on a strip 3 kilometers deep and 50 kilometers long in the Wienerwald, no one takes the trouble to locate the marks, and all the trees are being cut. Trees planted along the banks of the Danube to prevent flood and washing have also been cut. The famous Waldgürtel (forest belt) has almost been entirely destroyed. Many people make a regular business of stealing wood and selling it; school-boys make 100 kroner a day, and many coachmen have become very wealthy. In the Hütteldorf forest there are, on the average, 10,000 wood-thieves at work on weekdays and 100,000 on Sundays.—*W. N. Sparhawk.*

524. Anonymous. **Washington's sick sycamores.** Amer. Forestry 26: 267. *1 fig.* 1920. —Concerns treatment of sycamores for the sycamore louse and oyster-shell scale.—*Chas. H. Otis.*

525. Archibald, Jno. C. **Points to remember.** Quart. Jour. Forest. 13: 165–185. 1919. —Twenty points which the author believes are especially important for forestry students to memorize are listed. They deal with a variety of subjects from silviculture to personal manners. These "points" are followed by a short discussion of nursery practice, planting, thinning, pruning, ditching, fencing, hedging, and walling. The silvical characteristics of a few common forest trees are also taken up briefly.—*C. R. Tillotson.*

526. Augur. **Aus dem deutschen Forstjahr 1919. [Developments in German forestry in 1919.]** Deutsch Forstzeitg. 35: 185–188. 1920.—Notes various developments affecting the personnel, as a result of the loss of large forest areas by the treaty of peace and as a result of the Revolution.—*W. N. Sparhawk.*

527. B., C. U. **The importance of vertical stacking in the seasoning of converted material.** Indian Forester 46: 238–239. *1 pl.* 1920.—In the manufacture of boxes for special purposes, water seasoning in the log form is necessary. After cutting, the material should be stacked on end for 15 days and then piled horizontally for 3–6 months, to secure the best material. The difference in red and white *Bombax* is due to a difference in the grain of the wood.—*E. N. Munns.*

528. Bailey, W. A. **Length of time taken by sal seedlings to establish themselves.** Indian Forester 46: 307–309. 1920.—Fenced and cultivated plots show a much more fully stocked stand of sal seedlings than plots not so cared for. So far, it has taken ten years for natural-sown seedlings to develop into a full crop of fully established young plants. [See also next following Entry, 529.]—*E. N. Munns.*

529. BAILEY, W. A. **Season of growth of sal, Shorea robusta.** Indian Forester 46: 317. 1920.—Measurement of sal sample plots showed a growth of but 0.2 inch in circumference in the June-to-January period, while a normal increment for a full year is 1.0 inch. It may be that maximum growth takes place before the monsoon. [See also next preceding Entry, 528.] —*E. N. Munns.*

530. BALTZ. **Die Weymouthskiefer (Pinus strobus.) [The Weymouth pine.]** Forstwiss. Centralbl. 41: 302–307. 1919.—Suggests caution in planting white pine on a large scale in Germany, because it is susceptible to blister rust (*Peridermium strobi*), it has a decided tendency to develop many branches which hang on even after they die, and so yields inferior lumber; and it is attacked by the pine bark-louse (*Chermes strobi*), which retards growth and even kills the trees or so weakens them that they are attacked by the fungus *Agaricus melleus.* Neither does this tree, as has been supposed by some, thrive on all kinds of sites, but requires a fair amount of moisture and prefers good soil, upon which native species will generally yield better returns. Some of the failures of white pine plantations are due to carelessness in selecting the sites. The wood is not of particularly high quality; even attempts of the Diamond Match Company in Germany to use it for match manufacture failed, because it did not split well and was too brittle. Planting in pure stands is not recommended, but on account of its good silvical qualities it is a good species to plant in mixed stands with spruce, beech, and Scotch pine, especially to fill openings which may develop in such stands after they are established. The name "silk fir" (*Seidenföhre*) has been used in Baden and the Palatinate to avoid the English "Weymouth pine." "White pine" conflicts with *Pinus silvestris*, called white pine in Austria to distinguish it from the black pine. Baltz suggests "Strobe."—*W. N. Sparhawk.*

531. BANDEKOW. **Die Anwendung der Photogrammetrie in der Forsteinrichtung. [Use of photographic surveying in forest management.]** Deutsch. Forstzeitg. 35: 60–61. 1920.—Suggests that aerial photography will be very useful in mapping forest areas.—*W. N. Sparhawk.*

532. BEEVOR, SIR HUGH R. **Young woods in Belgium.** Quart. Jour. Forest. 13: 272–275. 1919.—This is a brief discussion of the methods followed and the species used in recent forest planting operations in Belgium.—*C. R. Tillotson.*

533. BROWN, WILLIAM H., AND ELMER D. MERRILL. **Philippine palms and palm products.** Forestry Bur. Philippine Islands Bull. 18. *129 p., 44 pl.* 1919.—A general consideration of the economic uses of all known Philippine palms, comprising 123 species in 24 genera. Keys are given to the genera and species and brief descriptive notes, all local names, distribution, and occurrence are noted for each species. The group is one of very great economic importance, yielding a multitude of materials entering the internal and external commerce of the Philippines.—*E. D. Merrill.*

534. BRUCE, DONALD. **The height and diameter basis for volume tables.** Jour. Forestry 18: 549–557. 1920.—Volume tables are based upon diameter and height, the measurement of the former "breast high" being generally accepted. While more variable than diameters taken at some other heights, it is precise enough for forest practice. In height measurements, there is little conformity. Total height is correct for sample plot work and cubic foot volume tables. For general practice, total height is not always possible and there is a wide divergence between the fixed top diameter and the merchantable height. In the latter case, the divergence varies with the intensity of the utilization and the practice of the region. With tables prepared to a fixed top, a corrective factor may be applied in accordance with the practice of the logger and region. The use of form factors only serves to complicate the matter.—*E. N. Munns.*

535. BRUCE, DONALD. **A proposed standardization of the checking of volume tables.** Jour. Forestry 18: 544–548. *1 fig.* 1920.—Volume tables need better and more uniform check-

ing. By lax methods checks are made which do not show the true state of affairs. Of three methods possible, that of the average deviation appears to offer the greatest possibilities. Two tests should be made of every volume table, a comparison of the true volume against the table volume, and a computation of the average deviation of the individual volumes from it. With these tests prepared for each table it should be possible to determine the accuracy of the table for use in any region or for any set of trees by the degree to which they fit.—*E. N. Munns.*

536. Bryant, H. B. **A suggested general forest organization for the Madras Presidency.** Indian Forester 46: 205-212. *1 fig.* 1920.—It is proposed to organize the work under the four branches: Working Plans, Exploitation, Clerical and Educational. The functions of each branch and its organization are depicted.—*E. N. Munns.*

537. Cape, John. **The measurement of timber.** Trans. Roy. Scot. Arbor. Soc. 33: 127-138. 1919.—The author points out the inaccuracy of the "quarter girth system" of measuring timber, which has become so universally used in the British Isles, discusses other systems of measurement and finally proposes for use the formula 1/2 ($D^2$) L. The amount of manufactured material produced from a log is taken as equal to a square log, having as its section an area equal to the square inscribed in the mean sectional area of the log.—*C. R. Tillotson.*

538. Carhart, A. H. **Recreation in the forests.** Amer. Forestry 26: 268-272. *10 fig.* 1920.

539. Cary, Austin. **Reflections.** Jour. Forestry 18: 472-476. 1920.—The professional forester has laid himself open to criticism because he has not purchased and put into operation on his own lands what he has been preaching as good for the lumberman.—*E. N. Munns.*

540. Claughton-Wallin, H., and F. McVicker. **The Jonson "absolute form quotient" as an expression of taper.** Jour. Forestry 18: 346-357. 1920.—Investigations to determine the extent to which the Jonson "absolute form quotient" agrees with American timber shows that it is of great value in reducing the number of field measurements necessary to prepare an ordinary volume table. Tried out on small eastern pines and spruce the results were surprisingly good and even in the large timber of the American northwest, the theory is of great value. For large timbers the root swelling interfered to a considerable extent, but below 12 inches breast high root swelling is a negligible factor. Form class is hard to determine, but density appears to be an excellent criterion of the average form of trees in even-aged stands, and a relation between density and form class can be established.—*E. N. Munns.*

541. Dallimore, W. **Elms and elm timber.** Quart. Jour. Forest. 14: 109-118. 1920.—This article discusses the difficulties attending the sale of elm timber by owners in the British Isles, attributes it to the failure of both grower and timber merchant to recognize and keep separate the several different kinds of elm. Discusses the characteristics of the elms of Britain.—*C. R. Tillotson.*

542. Deb, Sasi Mohan. **Tea box industry in Upper Assam.** Indian Forester 46: 304-307. 1920.—A list of the woods in order of their value for tea boxes is given and their method of manufacture is described.—*E. N. Munns.*

543. Eberhard. **Was will der Abrücksaumschlag (Keilsaumbetrieb)? [Wedge strip cuttings.]** Forstwiss. Centralbl. 41: 441-448. 1919.—With most silvicultural systems that depend upon natural reproduction, considerable damage is done to young growth by the removal of the older trees. This is particularly true where, as in most cases, successive cuttings proceed *away* from roads and *upward* on slopes. Under the system here proposed cutting begins half way between main roads, in level country, and proceeds *toward* the roads, so that logs are not dragged over young growth. On slopes, cutting strips lie up and down the slope. The system involves a preparatory stage, with frequent light thinnings in the upper crown

class over the whole area until reproduction is established and two or three years old. This preliminary stage is practically the same in all methods relying on natural reproduction. The method described differs from the strip selection system (Blendersaumschlag) in that the resulting new stand in each compartment is even-aged or at most divided into a few even-aged groups. It differs from the shelterwood system in that the removal of the old stand is not carried on uniformly over the whole area but is done unevenly in strips or wedge-shaped patches. It is claimed that damage both from windfall and from logging is very small, while logging costs are kept down to a minimum.—*W. N. Sparhawk.*

544. ECKSTEIN. **Wieder die Buchen-Wollschildlaus, Cryptococcus fagi. [The beech wooly-scale-louse.]** Deutsch. Forstzeitg. 35: 194–195. 1920.—Notes on the life history of the beech louse. Its attacks are frequently followed by beetles such as *Tomicus domesticus*, and *Lymexylon dermestoides*, and by the fungus *Nectria ditissima*, which kills the tree. The louse alone does not kill the tree. Means of control are suggested.—*W. N. Sparhawk.*

545. ECKSTEIN. **Zuckererzeugung in den Lärchenwaldungen des Wallis. [Sugar production in the larch forests of Canton Wallis.]** Deutsch. Forstzeitg. 35: 195–196. 1920.—During the abnormally hot summer of 1919 the foliage of the larch stands in Canton Wallis, Switzerland, was covered with a white substance containing a large percentage of sugar. This was in the form of little balls 1–2 cm. in diameter and hundreds of pounds could be collected in a short time. It is supposed to have been due to the crystallization of "honey dew" secreted by the leaf louse *Lachnus laricis*. Somewhat similar is the "manna" produced by *Coccus manniparus* on *Tamarix mannifera* on the Sinai Peninsula, also a manna on oaks in Mesopotamia, one in Australia on eucalypts, one on *Cedrus libani*, and a similar product of unknown origin, in the vicinity of Briancon, France.—*W. N. Sparhawk.*

546. ELLIOTT, F. A. **Airplane patrol of the forests.** Amer. Forestry 26: 206–208. *4 fig.* 1920.

547. EULEFELD. **Auffallende Erscheinung im Laubholzwald. [Peculiar phenomenon in deciduous forest.]** Deutsch. Forstzeitg. 35: 8–9. 1920.—In 1919 beech foliage in Germany turned brown much earlier and was darker colored than usual. Yet the leaves did not fall, even after considerable cold weather and snow. Possibly the abnormally dry summer did not permit free development of the winter buds, with consequent lack of enough pressure to push the leaves off. Due to the early drying of the foliage, many of the twigs are poorly lignified and will probably be winter-killed in case of very cold weather. Although the beech mast was very abundant in the fall of 1918, there was comparatively little germination, nor did the horns of deer develop as well as usual. This is thought to be because the abnormal 1918 season prevented the beechnuts from filling out.—*W. N. Sparhawk.*

548. EULEFELD. **Kurze Mitteilung von der Harznutzung im Jahre 1920. [Turpentining in 1920.** (Should be 1919.)] Deutsch. Forstzeitg. 35: 60. 1920.—Gives yields and net income from turpentining Scotch pine stands in Hesse, during 1919.—*W. N. Sparhawk.*

549. FABRICIUS. **Gründung einer Bayerischen Rinden-Verwertungs-Aktien-Gesellschaft. [Bavarian Tan-bark Exploitation Company.]** Forstwiss. Centralbl. 41: 474–475. 1919.—Germany consumed, in the year before the war, 80,000,000 kgm. of tannin, of which only 14,000,000 kgm. was produced from domestic materials (90,000,000 kgm. of oak and 45,000,000 kgm. of spruce bark). From Austria was imported from 25,000,000 to 36,000,000 kgm. of spruce bark. The spruce yields more tannin (11.5 per cent vs. 10 per cent for oak), but does not make as good leather as the oak. Germany could produce perpetually at least 220,000,000 kgm. of spruce bark per annum. Bavaria can produce 62,500,000 kgm., but thus far the bark has had to be shipped to extract plants in North Germany. The new corporation plans to build a plant in Bavaria. After the tannin has been extracted the bark will be made into briquettes for fuel in the plant and for sale. Its heat value is about equal to that of wood, peat, or Saxon lignite, about half that of good coal.—*W. N. Sparhawk.*

550. Fernow, B. E. [Rev. of: **New Jersey Department Conservation and Development, Annual Report, 1919.** Trenton, New Jersey, 1919.] Jour. Forestry 18: 165–166. 1920.

551. Fisher, R. T., and E. I. Terry. **Management of second growth white pine in central New England.** Jour. Forestry 18: 358–366. 1920.—Studies show that the shelterwood system is best adapted for white pine second growth in pure stands, using a combination of thinning with clear cutting. Reproduction is thus assured though there has been much trouble with snout beetles in seedlings and the pine weevil in saplings. Slash may be left on the ground in the mixed hardwood and pine stands but must be removed in pure pine stands as it wastes much space and precludes reproduction.—*E. N. Munns.*

552. Fitzwater, J. A. **Discussion of the Pinchot Committee report.** Jour. Forestry 18: 464–466. 1920.—Forest devastation in the Inland Empire (Northwest U. S. A.) has not been as severe as it has been depicted but there is need for a forest program handled by the Federal government rather than by the individual states. Acquisition of cut-over lands by the government is favored and the cost of conservative logging and mature timber should be borne by the public.—*E. N. Munns.*

553. Forbes, R. D. **Specialization vs. generalization in forestry education.** Jour. Forestry 18: 383–390. 1920.—See Bot. Absts. 6, Entry 501.

554. Green, Frederick J. **Germinative capacity of pine seed.** Quart. Jour. Forest. 14: 140–141. 1920.—Scotch pine seed collected from trees of several ages was left exposed to the heat of an unused hothouse for one summer. It was sown the following spring and gave the following germination results: Seed from 15-year old trees, 87 per cent; from 30-year old trees, 50 per cent; from 45-year old trees, 30 per cent; from 60-year old trees, 15 per cent; from 110-year old trees, failure. These results agree with those discussed in another article, *Ibid.*, January, 1910.—*C. R. Tillotson.*

555. Greenfield, W. P. **The beech in Lincolnshire.** Quart. Jour. Forest. 13: 269–271. 1919.—This is a short discussion dealing with the lack of beech reproduction on the chalk Wolds of Lincolnshire, where there are many good beech woods but no natural beech regeneration. The author raises the question as to reasons for this, but does not answer it.—*C. R. Tillotson.*

556. Grieve, J. W. A. **The self-contained forest estate in the Himalayas.** Indian Forester 46: 273–279. 1920.—Each forest unit should become as self sustaining as possible, the unit to be the forest community. Forest and field crops may be grown simultaneously, and a group of skilled forest workmen evolved.—*E. N. Munns.*

557. Guthrie, John D. **Early English forest regulations.** Jour. Forestry 18: 530–541. 1920.—See Bot. Absts. 6, Entry 932.

558. Hagem, Oscar. **Svensk frøundersøgelser.** [**Seed-testing in Sweden.**] Tidsskr. Skogbruk 28: 72–80. 1920. [A review of the report published by Edward Wiebeck.]—Both Wiebeck and the author found appreciable differences in the quality of Scotch pine and Norway spruce seed, the better seed coming from the warmer parts of these two countries. Wiebeck's investigations show that, for northern Sweden, 50 per cent or higher germination was obtained from seed collected where the isotherm for June to August was between 13 and 14°C.; the medium quality of seed, which germinated from 41 to 50 per cent, was collected where the isotherm for the same months was from 12 to 13°C.; and the poorer kind, which germinated only 40 per cent or less, was collected where the isotherm showed below 12°C. Hagem's results correspond quite generally with these, there being a discrepancy of only 0.5°C. —*J. A. Larsen.*

559. Hall, R. C. **The forest situation in France.** Jour. Forestry 18: 522–529. 1920.—The French forest policy of keeping 18 per cent of her land area in permanent forests was justified by the results in the Great War, for through her forests France was self sustaining and furnished the American and British armies with their wood supplies as well. With the coal supply virtually shut off, wood formed an important fuel. During the war the bulk of the cut came from the private forests, the government being reluctant to permit over-cutting in the state forests. The present problem in France is the restoration of the invaded region, the extent to which present needs can be met from the public forests, and the recuperation of private woodlands. Much of the invaded area will have to be replanted, which will be a long-time project, because of the great acreage, the high cost and the problem of ownership. For present needs over-cutting will be necessary, as the unfavorable financial exchange prevents importation. Private woodlands should be purchased now, but this is financially out of the question. The management of private lands has long been unsatisfactory and some further measures of state control are being advocated.—*E. N. Munns.*

560. Haslund, Ole. **Granens Stammeform.** [**Form factor and form-class of Norway spruce.**] Tidsskr. Skogbruk 28: 44–53. *Fig. 4.* 1920.—By making use of the fact that the form factor varies according to the form-point, which is a relation between form of crown and form of stem, certain characteristic relations of crown, form, diameter and height are expressed and the variations of these according to the site and density of the stands. The form classes are expressed as 0.55, 0.60, 0.65, 0.70 and 0.75, the last being the best form. A tree of 40 cm. diameter breast high in the 0.55-class has a crown diameter of 5.5 m., and a tree of the same diameter of stem but in the 0.70-form class has a crown diameter of only 4.3 m. Trees of the first kind need an area of 30.25 sq. m., while those of the latter require only 18.49 sq. m. In the first class there would be 33 trees per dekar (0.1 hectar) and those of the 0.70 class would stand 54 per dekar. From this study it is concluded, among other things, that it is very poor policy to cut in such a manner as to open the stand sufficiently to lower the form class. —*J. A. Larsen.*

561. Havelock, W. B. **Common and Japanese larch at Brocklesby Park.** Quart. Jour. Forest. 14: 59–61. 1920.—Comparisons of the growth at Brocklesby Park, England, of Japanese and European larch, which was set out in 1903–04, spaced 4 by 4 feet and mixed with hardwoods in the proportion of two softwoods to one hardwood. Measurements, presumably in the winter of 1919–20, show the following average girths of trees on an area which has been thinned three times: Japanese larch, 14 inches; sycamore, 11.2 inches; ash, 9.7 inches; elm, etc., 9.4 inches. On another area, twice thinned, European larch has an average girth of 13.1 inches; sycamore, 11 inches, ash, 9.6 inches, beech, 5.4 inches; and other hardwoods, 8.1 inches. [See also following Entries, 562, 563.]—*C. R. Tillotson.*

562. Havelock, W. B. **European and Japanese larch at Brocklesby Park.** Quart. Jour. Forest. 14: 101–103. 1920.—The growth of both European and Japanese larches in mixture with various hardwoods is discussed briefly. The larches in every instance have exceeded the other species in rate of growth. [See also next preceding and next following Entries, 561, 563.]—*C. R. Tillotson.*

563. Havelock, W. B. **The western larch (Larix occidentalis) on the Brocklesby Park estate, Lincolnshire.** Quart. Jour. Forest. 14: 96–100. 1920.—*Larix occidentalis* on this estate is longer in establishing itself than either the European or Japanese species but in the power of resistance to frost and drought, there does not appear to be much difference between them. It does not appear to thrive where there is thick grass in the plantation at first. Its height growth in the young stage is inferior to the European and Japanese larches. Shelter appears to be desirable for it in its early years. [See also preceding entries, 561, 562.]—*C. R. Tillotson.*

564. Hiley, W. E. **The mean annual forest per cent.** Quart. Jour. Forest. 13: 156–165. 1919.—By the use of the soil expectation value formula and a money yield table for Scots pine,

the writer has constructed a graph from which he can read the mean annual forest per cent for that species when the soil value and rotation are known or assumed. From this graph the optimum financial rotation, the loss due to cutting woods before the financial rotation is reached, and the price which may be paid for land for afforestation (assuming a certain interest rate and rotation) can also be readily determined.—*C. R. Tillotson.*

565. Hofmann, J. V. **How fires destroy our forests.** Amer. Forestry 26: 329–336. *17 fig.* 1920.

566. Hopkinson, A. D. **A note on the financial results of pine and beech forests in Normandy.** Trans. Roy. Scot. Arbor. Soc. 34: 82–87. 1920.—With Scotch pine grown in an 80-year and beech in a 190-year rotation, the pine is nearly five times as advantageous as the beech from a purely financial point of view. This is partly accounted for by the fact that this rotation for beech is not its financial rotation while 80 years is perhaps the financial rotation for pine. From the silvicultural point of view, the advantage is certainly with the beech, which as a pure crop has many advantages which can not be assigned to extensive areas of pure pine.—*C. R. Tillotson.*

567. Hutchins, D. E. **The forests of New Zealand.** Trans. Roy. Scot. Arbor. Soc. 33: 119–123. 1919.—The forests of New Zealand are the best softwood forests in the southern hemisphere. They have never been surveyed and only vague estimates have been made of their area and stand of timber. The output of sawn timber indicates that over the area milled the stand has been 2½ times that of the average of the virgin forests of America. Over small areas some timber stands of 200,000 superficial feet per acre have been recorded. New Zealand timbers excel those of Europe in quality, but are less desirable than those of America. The value of kauri timber is well known, but it is not generally known that it is the largest timber-producing tree in the world, on account of the small taper of its trunk. There was 3,000,000 acres of kauri forest in New Zealand; very little is now left but there are about 500,000 acres that are restorable. Totara, the next most valuable New Zealand timber, is the best of all the world's *Podocarpus* timbers. The most valuable forests now left in New Zealand are of totara. Rimu, the common housebuilding timber, is beautiful, fine figured and surpasses oak in color and grain.—In 1909 the forest area of New Zealand was estimated at 17,000,000 acres. The New Zealand forests are worth more than all the known mineral wealth of the Dominion and they offer more employment than any other industry. Forest plantations are about 30,000 acres in extent and have cost about 13 pounds per acre.—*C. R. Tillotson.*

568. Hutchins, D. E. **Rate of growth of trees in relation to forestry. A criticism of Mr. E. Maxwell's paper.** New Zealand Jour. Sci. Tech. 3: 1–7. 1920.—To consider growth of individual trees instead of forests is misleading. The five chief native timber trees of New Zealand in their forests grow faster than the five chief timber trees of Europe in theirs. While introduced trees should be planted, native ones should also be conserved. [See also Bot. Absts. 6, Entry 588.]—*A. Gundersen.*

569. Hutchins, D. E. **Waipona kauri forest.** New Zealand Jour. Sci. Tech. 2: 412. 1919.—See also Bot. Absts. 6, Entry 624.

570. Illick, J. S. **Management of the state forests of Pennsylvania.** Amer. Forestry 26: 339–342. *8 fig.* 1920.

571. Illick, J. S. **Some silvicultural problems in Pennsylvania.** Jour. Forestry 18: 502–511. 1920.—Forest planting includes some of the main problems of forestry. Planting of over 33,000,000 trees by the State with from 33 to 79 per cent of the various species living, shows that planting can be successfully done here. Most of the planting has been in the spring but successes of from 72 to 92 per cent for fall planting show this season is also suitable. The cost of planting ranges from $4.20 to $10.77 per thousand, 1919 costs being only $8.64 a

thousand as against an average of $6.05. Fire loss, in spite of local high hazards, amounts to only 0.03 per cent. In the past ten years over 9,000,000 trees have been distributed to private individuals, water companies planting 1,750,000 trees. Other planters include farmers, mining companies, municipalities, lumbermen, hunting and recreation clubs, and educational institutions.—*E. N. Munns.*

572. Ivy, T. P. **Forestry, livestock and cut-over lands of the south.** Amer. Forestry **26:** 299–302. *6 fig.* 1920.

573. Jardine, J. T. **Efficient regulation of grazing in relation to timber production.** Jour. Forestry **18:** 367–382. 1920.—Investigations have shown that there is a grave danger from sheep grazing to reproduction of the valuable timber species of the western United States through overgrazing, trampling and browsing, though under certain circumstances sheep may be of value in getting it established. Sheep may be an aid in the reduction of the forest-fire hazard through destruction of the fuel on the ground and the cutting up of litter and duff. The present needs in National Forest administration are for a policy to govern grazing, to either recognize grazing as having a place in forest management or to limit its growing use, and to provide for investigations to enable proper grazing regulation and inspection.—*E. N. Munns.*

574. Johannes, Gunnar. **Et lidet inleg for anvendelsen af 2/0 furu of nogle bemerkninger om planteskole og plantearbeide.** [**Notes on the use of 2–0 (Scotch) pine and remarks on nursery and labor conditions.**] Tidsskr. Skogbruk **28:** 54–60. *1 pl.* 1920.—In view of the greatly increased cost of raising nursery stock and of establishing plantations, and the unusual success attending the planting of 2–0 nursery stock in the littoral belt of Sweden, the author urges greater use of this stock and the employment of school children wherever possible.—*J. A. Larsen.*

575. Kay, James. **Red pine or Norway pine (Pinus resinosa).** Trans. Roy. Scot. Arbor. Soc. **33:** 157–161. 1919.—This is a discussion of the commercial importance, silvical characteristics and quality of wood of the red or Norway pine and in tabular form presents a comparison of the form factors, form quotients, and volumes of red and white pine for trees up to 9 inches in diameter.—*C. R. Tillotson.*

576. Kirkland, Burt P. **The democracy of national control.** Jour. Forestry **18:** 448–450. 1920.—A comparison of state action in legislature with that of the federal government does not show to the advantage of the former. If the forest policy is left to state control, the nation will be no better off than at present and it is inconceivable, in the light of past experience, that adjoining states would treat the same subject in the same way.—*E. N. Munns.*

577. Kirkland, Burt P. **Effects of destructive lumbering on labor.** Jour. Forestry **18:** 318–320. 1920.—The policy of unrestricted destructive lumbering leads to a disorganization of labor resulting in a denial of normal family life and the right of suffrage, and leading to irregularity of employment. Labor has no interest in the industry and holds a feeling of injustice which is largely responsible for ultra-radical doctrines.—*E. N. Munns.*

578. Kittredge, Joseph, Jr. **Silvicultural practice in coppice-under-standard forests of eastern France.** Jour. Forestry **18:** 512–521. 1920.—The mixed hardwood forests of France are managed to furnish a sustained annual yield with an area regulation. Coppice is used chiefly as cordwood and is ready for cutting at an average age of 30 years; the standards are in multiples of the age of the coppice stands. Marking is done by a technical forester upon all lands, regardless of ownership, and, while concerned with reserving the best trees, the uniformity of the stand is excellent. The regulations governing the sales are printed in pamphlet form for all France and a number of the clauses are given in full. The average yield is from 500 to 1000 board-feet per acre, in logs, with an average of ten cords of wood per acre, of which about one-half is from 3 to 6 inches in diameter.—*E. N. Munns.*

579. KOCH, ELERS. **Discussion of the Pinchot Committee report.** Jour. Forestry 18: 458–460. 1920.—The plan of the Pinchot Committee is believed idealistic, and not feasible. The time is not ripe for such a program of forest policy, but attention should be concentrated on the fire problem, and forest-fire control by the states will go farther than national control of lumbering.—*E. N. Munns.*

580. KOEHLER, A. [Rev. of: WILSON, T. R. C. **Effect of kiln drying on the strength of airplane parts.** Rept. No. 68, Nation. Advisory Committee for Aeronautics. Washington, D. C., 1920.] Jour. Forestry 18: 421–423. 1920.

581. LEOPOLD, ALDO. **Forestry of the prophets.** Jour. Forestry 18: 412–419. 1920.—See Bot. Absts. 6, Entry 940.

582. LÖWINGER, EUGEN. **Polens Fortswirtschaft und Deutschland. [Poland's forestry and Germany.]** Deutsch. Forstzeitg. 35: 195. 1920.—In order to import needed materials Poland must export raw material, particularly forest products. The Polish government is encouraging cutting of timber for this purpose as well as to supply home needs, and is backing a large private sawmill company which is to saw lumber for home and foreign trade. A 15,000 hectare tract of virgin forest in the province of Grodno has been made available for exploitation.—*W. N. Sparhawk.*

583. LUDWIG. **Gewinnung von Gerbrinden mittels Dampfschälung. [Use of steam in harvesting tan-bark.]** Forstwiss. Centralbl. 41: 401–404. 1919.—Scarcity of tanning material during the war led to the discovery that not only oak bark, but even that of spruce, is of great value for tanning. The use of domestic products will continue, as far as possible, because of high prices for quebracho, high freight rates, and unfavorable financial exchange. Harvesting of bark has heretofore been possible only between May and July or August. Experiments have shown that bark can be removed at any time by the use of steam, very much more cheaply than in the old way and without impairing its value. GUTSCHOW invented a portable steaming and drying apparatus that could be taken into the woods. Oak bark, usually directly used, must be thoroughly dried; spruce bark is more often extracted and only a little drying is required. Less steaming is required if the bolts are steamed while green, and there is also less loss of tannin due to weathering. The use of spruce bark for tanning has special significance for the paper and pulp industry, since the bark has to be removed for pulp making and has not hitherto been utilized. It can now be sold as tanning material, for enough to pay the cost of removal and give a good profit besides.—*W. N. Sparhawk.*

584. MACLARTY, ALEXANDER S. **Forest tree seed.** Trans. Roy. Scot. Arbor. Soc. 33: 138–146. 1919.—This paper discusses several points which should be given consideration in the collection of forest tree seed.—*C. R. Tillotson.*

585. MAKINS, F. K. **Natural reproduction of sal, Shorea robusta, in Singhbhum.** Indian Forester 46: 292–297. *Pl. 16–18.* 1920.—Sal reproduction is satisfactory where drought is not severe, but much of the region considered has long periods of dry weather; only about 20 per cent of the forest area has reproduction. Deposition and evaporation of dew have an important influence on sal. Heavy shade appears to be a benefit but heavy litter prevents establishment. Young sal plants require assistance in making their way through climbing plants, while non-climbers act as a nurse crop. A grass cover does not prevent sal establishment though better results are obtained after burning.—*E. N. Munns.*

586. MASON, FRED. **Discussion of the Pinchot Committee report.** Jour. Forestry 18: 451–458. 1920.—Exception is taken to the Committee's attitude towards the lumbermen, who are not to blame for the living conditions and the labor troubles within the industry. Forest destruction by the lumber interests is not a needless act, but is forced by economic conditions. Finances in the lumber industry have been so entangled that conservation could not be practiced, though some measures have been forced upon them. Measures which are feasible include a yield tax, a forest loan board, and the purchase of forest-producing lands by the public. An educational program is suggested to teach lumber conservation in all phases of its use.—*E. N. Munns.*

587. Mason, W. H. **Planting in pits.** Quart. Jour. Forest. 14: 141–142. 1920.—The planting of larch in pits where the turf was cast, grass down, into the bottom of the pit and finely chopped up, resulted in complete failure of the plantation. The sod at the bottom of the pits, it was discovered, had rotted away, leaving a cavity into which all the moisture around the tree drained.—*C. R. Tillotson.*

588. Maxwell, E. **Rate of growth of indigenous and exotic trees in New Zealand. Comparison of the rate of growth in relation to its bearing on forestry.** New Zealand Jour. Sci. Tech. 2: 371–376. *3 tables.* 1919.—Waste of native forests has brought these near extinction. Introduced trees grow much more rapidly than native ones. Considers *Sequoia sempervirens* especially destined to play a very important part in future New Zealand forestry. [See also Bot. Absts. 6, Entry 568.]—*A. Gundersen.*

589. Meredith, E. T. **Forests as a farm crop.** Amer. Forestry 26: 337–338, 342. 1920.

590. Meredith, E. T. **Need of forests for wood pulp.** Amer. Forestry 26: 362–363. 1920. [From a letter to the American Paper and Pulp Association.]

591. Moore, Barrington. [Rev. of: Brown, Nelson C. **Forest products, their manufacture and use.** *471 p., 120 fig.* John Wiley & Sons: New York, 1919.] Torreya 20: 57–59. 1920.—The book treats of the history, process of manufacture, and use of the principal forest products. Of special interest is information on sources of supply with relation to present and future forest resources. The book is well illustrated and provided with an index.—*J. C. Nelson.*

592. Morrison, W. G. **Some proposals with regard to natural afforestation in a New Zealand mountain area.** New Zealand Jour. Sci. Tech. 2: 339–349. 1919.

593. Munger, T. T. **Forestry in the Douglas fir region.** Amer. Forestry 26: 199–205. *7 fig.* 1920.

594. Murray, J. M. **Variation in the Scots pine (Pinus silvestris, L.).** Trans. Roy. Scot. Arbor. Soc. 34: 87–91. 1920.—*C. R. Tillotson.*

595. Olmsted, Frederick E. **Business phases of forest devastation.** Jour. Forestry 18: 311–316. 1920.—The provisions of the Committee for Application of Forestry to correct certain business practices of the lumber industry, are necessary to carry out the program as a whole, since forestry would have to control prices, capitalization and other business conditions. Arguments are presented showing silviculture to be a business as well as an art and science, for problems of labor, production, distribution and costs must be met.—*E. N. Munns.*

596. Parkin, John. **A plea for the consideration of the aesthetic side in restocking our war-felled woods.** Quart. Jour. Forest. 13: 254–265. 1919.—See also next following Entry, 597.

597. Parkin, John. **A plea for the consideration of the aesthetic side in restocking our war-felled woods.** Quart. Jour. Forest. 14: 33–48. 1920.—See also next preceding Entry, 596.

598. Parnell, R. **Hazara Forest Division, North-West Frontier Province.** Indian Forester 46: 224–237. *5 fig.* 1920.—The business of the Hazara Forest from 1880 to 1920 is summarized and analyzed as to improvements, law cases, fires, products and finances.—*E. N. Munns.*

599. Pearce, W. J. **Relation of insect losses to sustained forest yield.** Jour. Forestry 18: 406–411. 1920.—Insects, especially the Dendroctonus beetles have an important place in the future management of forests. It was estimated on the Dolores timber survey project in Colorado that in the life of the stand (about 300 years) 90 per cent of the trees, by volume,

were killed by insects and 10 per cent by other causes. This amounts to a loss of ½ per cent per annum, which is less than in pine stands. Insects will be an important feature in future timber-sale practice, through their effect upon the reserved stand and upon the black-jack stage of the western yellow pine.—*E. N. Munns.*

600. Peters, J. G. **Co-operation between the federal government and the states.** Jour. Forestry 18: 477–485. 1920.—The whole question of a national forest policy devolves upon the finances. Acquisition of forests by the federal government is slow and can not keep up with denudation. State acquisition of cut-over lands is desirable on a large scale, but the cost is more than the states can bear. Planting of denuded lands is badly needed and the nation, the states and private owners should each bear a part in the cost. Fire protection through the present Week's law will assure the maintenance of present areas of young stands and will aid nature in reforesting large areas, but additional funds are necessary to make the plan of real nation-wide benefit. Farm forestry has a real place in the forest program, supplying part of the needs of the rural population.—*E. N. Munns.*

601. Peyton, Jeannie S. **Forestry movement of the seventies, in the Interior Department, under Schurz.** Jour. Forestry 18: 391–405. 1920.—A history of the four years of the forestry movement in the United States of America under Secretary Carl Schurz and General James A. Williamson, Commissioner of the General Land office. The bills drafted and not passed by Congress in that period were forerunners of the present system of forest administration and regulation.—*E. N. Munns.*

602. Pinchot, Gifford. **Where we stand.** Jour. Forestry 18: 441–447. 1920.—A résumé of the principal arguments against the proposed national forest policy for the United States shows the objection because of possible confiscation is merely an attempt to dodge the main issue. The constitutionality of the measure must be passed upon after the laws have been drawn up. The national government is better able to handle the administration of a forest policy than are the individual states, while the fear of bureaucracy is not supported by past developments. There is an awakening of the forestry profession to the realization of the need of such a policy, and their activity in its favor.—*E. N. Munns.*

603. Preston, John F. **Discussion of the Pinchot Committee report.** Jour. Forestry 18: 460–464. 1920.—Federal action in a forest program is needed, but the proposed plan is wrong in attempting to force the measure upon the lumber industry rather than having it come about through education. The state is the strongest point in the unit and state legislation should be sufficient to bring about the desired end. Coöperation with the lumbermen is to be desired in any plan.—*E. N. Munns.*

604. Rane, F. W. **Use of wood for fuel.** Proc. Soc. Promotion Agric. Sci. 39: 48–53. 1919.—Attention is called to the availability and value of wood for fuel, especially in New England. The suggestion is made that wood obtained in clearing out wood-lots and from forest trees unsalable as lumber be cut into lengths suitable for use in stoves, furnaces, and fireplaces instead of into 4-foot or cord-wood lengths, as at present. The utilization of wood in the production of different chemicals is pointed out as a future asset of great value to the United States.—*H. N. Vinall.*

605. Ridsdale, P. S. **The memorial trees of the United States.** Garden Mag. 30: 177–180. *2 fig.* 1920.

606. [Ridsdale, P. S.] **State forests in Massachusetts.** Amer. Forestry 26: 323. 1920.

607. Riemenschneider. **Die preussische Forstverwaltung und das Landwirtschaftsministerium. [The Prussian Forest Service and the Ministry of Agriculture.]** Deutsch. Forstzeitg. 35: 170–171. 1920.—The Forest Service was transferred from the Ministry of Finance to that of Agriculture in 1880. It is suggested that this change has not proved altogether

for the best. Even though, in its former place, financial considerations may have been given undue weight, now agricultural interests are favored often to the detriment of the forests. Charges for by-products of the forest—pasturage, litter, seedlings, twigs for broom-making—have not been increased with the rise in other prices, and in many cases have been reduced since the war started. They now bear no relation to the cost of supervision. Both the forest and the public treasury would benefit if the Ministry of Finance were again in control.—*W. N. Sparhawk.*

608. Robinson, R. L. **Forest policy.** Quart. Jour. Forest. 14: 82–95. 1920.—This paper treats broadly of the pre-war development of forest policy particularly in the United Kingdom, although briefly also of that in other countries, discusses the part played by timber in the war, and summarizes what the author believes to be the main principles that underlie the development of forest policy.—*C. R. Tillotson.*

609. Roth, Filibert. **Great teacher of forestry retires.** Amer. Forestry 26: 209–212. *1 portrait.* 1920.—Appreciation of B. E. Fernow. [See Bot. Absts. 6, Entry 958.]

610. Rubner. [Rev. of: Grebe, C. **Studien zur Biologie und Geographie der Laubmoose. I. Biologie und Ökologie der Laubmoose. (Studies on the biology and geography of foliaceous mosses. I. Biology and ecology of foliaceous mosses.)** Reprint from Hedwigia 59: 1917.] Forstwiss Centralbl. 41: 431–433. 1919.—Rubner points out the need for a thorough study of forest mosses and their interrelation with soil conditions and with the composition of the forest.—*W. N. Sparhawk.*

611. Sampson, Arthur W. [Rev. of: Hitchcock, A. S. **Genera of grasses in the United States, with special reference to economic species.** U. S. Dept. Agric. Bull. 772. *307 p.* 1920.] Jour. Forestry 18: 426–427. 1920.

612. Schlich, Sir William. **Forestry in the Dominion of New Zealand.** New Zealand Jour. Sci. Tech. 1: 201–210. 1918. [Slightly abridged from Quart. Jour. Forest. 12: 1–28. 1918.]—See also Bot. Absts. 1, Entry 1456.

613. Schwappach, A. **Waldbauvereine.** [**Societies for forest culture.**] Deutsch. Forst. zeitg. 35: 37–39. 1920.—Many societies for the practice of forestry have been formed recently in several Prussian provinces. They are voluntary associations of small owners who agree to manage their forests in accordance with technical advice to be given them by the Agricultural Council (Landwirtschaftskammer). The purpose is two-fold: first, to increase wood production on the now poorly managed small private holdings; second, to prevent compulsory coöperative management under strict state control. Schwappach fears that they will not be effective, and inclines to the belief that compulsory coöperative forests, managed by responsible officers and subject to state supervision, will be found necessary to increase the yield from small holdings.—*W. N. Sparhawk.*

614. Seybold, Karl. **Die Forstwirtschaft der Tatsachen (natürlicher Hochwaldbetrieb).** [**Forestry based on nature.**] Forstwiss. Centralbl. 41: 405–426. 1919.—Advocates getting away from theory and arbitrary rules and methods in forest management, with a closer adherence to natural laws and the phenomena of forest growth. Accurate prediction of growth for long periods is impossible, and the most carefully made theoretical working plans are always sooner or later upset by natural influences, such as windfall, drouth, frost, insects, fires, failure of seed years, and the like. The system proposed has been tried out since 1900 on a 5,000-hectare fir and beech forest in Alsace. An essential feature is the 5-year cutting cycle, by which every part of the forest is gone over every 5 years. This makes possible the removal of diseased, suppressed, and ripe trees and groups of trees at the most suitable time, and is especially favorable to growth of the remaining trees and to natural reproduction. Another feature is the maintenance of a continuous forest cover, unbroken by clearings except where they result from accident. The frequent cuttings insure light and ventilation. Instead of

extensive, pure, even-aged stands, the age classes are mixed together in small groups, as usually occurs in nature, so that the forest takes on the appearance of a selection forest. Because of the long periods required for trees to mature, soil exhaustion can not be prevented by rotation of crops as easily as with other crops. The same result can be obtained, however, by using mixed stands, composed of species with different soil requirements. The beech is especially valuable for improving soil fertility, as well as for favoring better development of the associated conifers, and its proportion in the stand can be varied from time to time as conditions require. Other species, such as oak, maple, ash, elm, birch, alder, and Scotch pine, may also be used with beech, provided they are given several years start and are planted in large enough groups so that they will not be shaded out. For purposes of management forests should be divided into compartments of an average size of not more than 10 hectares. At the 5-year intervals, cutting is done, not in accordance with a predetermined working plan, but according to the actual silvicultural needs of each individual compartment, and also according to current market conditions. In some, no cutting at all may be done; others may be cut very heavily. The usual method of determining the annual cut is very complicated, involves much manipulation of figures, and can not be accurate. The average increment and the allowable cut can be better and more simply determined from a series of small permanent sample plots on the different sites, to be cut over regularly with the rest of the stand. Other advantages of the method described are the more intensive and careful handling of the forest, and the great simplicity and flexibility of the working plans.—*W. N. Sparhawk.*

615. Shepard, E. C. **Comments on the forestry program.** Jour. Forestry 18: 467–471. 1920.—The national forest policy, as prepared, is censured because it was prepared by foresters without the coöperation of the lumbermen, and because it calls the lumber industry to task for the lack of policy on the part of the government in the early days when timber lands were sold for nominal prices. France required hundreds of years to formulate and put into practice a substantial forest policy, and too quick an action in the United States, to which this paper refers, may prove a drawback to the whole plan.—*E. N. Munns.*

616. Silcox, F. A. **Forestry and labor.** Jour. Forestry 18: 317. 1920.—Labor is vitally affected by the economic condition of the lumber industry and the character of exploitation growing out of it. If the industry does not adopt democratic industrial relation policies voluntarily, it probably will be forced to this.—*E. N. Munns.*

617. Simon. **Ein Beitrag zur Erhöhung der Einnahmen aus den Forsten. [Suggestions for increasing revenue from forests.]** Deutsch. Forstzeitg. 35: 131–133. 1920.—The problem of increasing net returns from forests is very important in Germany today. This may be done by (1) reducing costs of production, (2) increasing volume production, or (3) increasing returns from wood. Artificial regeneration should, wherever possible, give way to natural reproduction, and where this is impossible the cheapest and most effective methods should be used. Reproducing areas should be carefully protected, especially against grazing. Thinnings should be made in such ways as to promote the most rapid volume growth. Forest officers, who will be responsible for all this work, should be thoroughly and carefully trained for it, and should be so treated that they will do the best work. Wood should be sold for the best prices possible, and, to this end, roads and other means of transportation should be kept in good condition. Low wood prices will not benefit the consumers, because the dealers will absorb all the margins. State sawmills are not favored until the point of view of laborers changes; i.e., until they become free from the idea that a government job is only a sort of pension.—*W. N. Sparhawk.*

618. Sklavunos, Constantine G. **Die Forstverhältnisse im heutigen Griechenland. [Forest conditions of modern Greece.]** Forstwiss. Centralbl. 41: 81–90, 173–184, 249–264. 1919.—All of Greece was well forested in prehistoric times, but the forest was reduced to about its present extent during the Homeric and post-Homeric periods. Most of the accessible forests near the coasts have gone, but there are still dense virgin stands in the mountains of the interior. There are three main forest zones:—(a) Evergreen hardwoods (0–800 m. eleva-

tion) with a dry subtype (0–500 m.) including such species as *Pistacia lentiscus*, *Olea Europaea*, *Juniperus Thoenica*, *Tamarix Hampeana*, *Quercus aegilops*, *Pinus pinea*; and a cooler subtype, characterized by *Quercus coccifera*, *Q. ilex*, *Arbutus unedo*, *A. andrachne*, *Myrtus communis*, *Laurus nobilis*, *Buxus sempervirens*, *Styrax officinalis*, *Celtis australis*, *Rhus cotinus*, *Ficus carica*, *Morus alba*, *M. nigra*. Common to both subtypes are: *Pinus silvestris* (in Macedonia), *P. halepensis*, *Cupressus sempervirens*, *Robinia pseudacacia*, *Alnus glutinosa*, and others. (b) Deciduous hardwoods (800–1500 m.), characterized at lower elevations by oaks, especially *Quercus robur*, *Q. conferta*, *Q. pedunculiflora*, *Q. pubescens*, *Q. pedunculata*, *Q. sessiliflora*, *Q. cerris*; higher up chestnut (*Castanea vesca*) is common. Other common trees of this zone are ashes, hornbeams, walnut, aspen, sycamore, elms, horsechestnut, maple, lindens, dogwood, hazel, beech. (c) Conifers (1500–2000 m.) comprising *Abies cephalonica*, *Pinus laricio* (*corsicana*), *P. leucodermis*, *P. peuce*, *Taxus baccata*, *Juniperus foetidissima*, *J. oxycedrus*.—Conifer forests (especially fir) occupy 55 per cent of the forest area. The stands are open, all-aged, and reproduction is seriously retarded by overgrazing. Growth is fairly rapid because of the long growing season and high mean temperatures. The total forest area, while not definitely known, owing to lack of surveys, is estimated at 1,800,000 hectares, including scrub forest, or 15 per cent of the total area of the new Greece (including territory added after Balkan wars). This is 0.38 ha. per capita. At least 6,600,000 hectares is absolute forest soil. The forests are very unevenly distributed, increasing from the South and east toward the north and west, and are most extensive in northern Greece and in Greek Macedonia. Forest destruction still continues, due to heavy overgrazing (especially by goats), wasteful and unregulated cutting, turpentining, charcoal making and lime burning, and insect depredations.—A large proportion of the forests belongs to the State, considerable to communes and monasteries, and a smaller proportion to private individuals. The private forests receive the best treatment, the communal and monastic forests the worst, and the State forests halfway between.—The development of a forest policy began in 1836, soon after the establishment of the monarchy. Cutting of saw timber from either State or private forests may be done only on permit, which is issued after the payment of a felling tax. Grazing on private forests is also subject to tax, but is free on public forests. The public forests are guarded by 250 forest guards, with 12 technically trained foresters and 3 inspectors, under the Forest Division of the Ministry for National Economy. This force is much too small, and is not well trained. The first forest school was established at Vytina in 1896 to train the lower personnel. A higher forest institute for training administrative officers is to be established at Athens by 1920. Various measures have been taken to encourage afforestation by communes and private individuals, and something has been accomplished.—The total annual yield of the forests of old Greece (figures for recently acquired territory not available) is estimated to be 1,720,566 cubic meters, probably in excess of the annual growth. In addition, Greece imports 126,000 cubic meters of wood (principally softwood construction material), making the per capita consumption 0.75 cubic meters. Imports came (1911) chiefly from Austria-Hungary, Roumania, Turkey, and Russia, and were exceeded in value only by grain and by coal. Exports, chiefly valonia and nutgalls for tanning, and turpentine and rosin, went mostly to Austria, Germany, Italy, and Turkey.—*W. N. Sparhawk.*

619. SMYTHIES, E. A. **Geology and forest distribution.** Indian Forester **46**: 319–320. 1920.—Geological features determine soil types, which determine water supply, soil depth, and soil aeration, so that geology is important in plant distribution.—*E. N. Munns.*

620. SPEIGHT, R. **New Zealand timbers and the borer.** New Zealand Jour. Sci. Tech. **1**: 142–144. 1918.—List of eighty species of which some were attacked by borer (*Anobium domesticum*) in Canterbury Museum.—*A. Gundersen.*

621. STEVEN, H. M. **Coniferous forest trees in Great Britain.** Trans. Roy. Scot. Arbor. Soc. **34**: 61–82. 1920.—This article deals with the various conifers of importance in British forestry. Their growth under different conditions of soil, elevation, exposure, etc., is considered; their environmental requirements and the principal silvicultural problems that arise in the growing of each conifer are discussed.—*C. R. Tillotson.*

622. Stevens, Carl M. **Forest industries and the income tax.** Jour. Forestry 18: 329–337. 1920.—A history of the development of the present United States income tax is given with its aims, organization and administration.—*E. N. Munns.*

623. T., E. P. [Rev. of: Surface, Henry E. **Feasibility of manufacturing paper from pulp from Tasmanian timbers.** Rept. Dept. Lands and Survey of Tasmania for 1914–1915. *P. 33–43.* Hobart, 1915.] New Zealand Jour. Sci. Tech. 1: 379–380. 1918.—One of the timbers the pulping qualities of which were investigated was *Nothofagus Cunninghamii*, known in Tasmania as "myrtle," and closely related to a timber similar to *Nothofagus Menziesii* (bushman's "silver birch," or "southland beech" of timber traders). Author recommends that, as a purely business enterprise, the utilization of Tasmanian hardwoods for pulp or paper making should not be given further consideration. Their fibers are too short. He also studied swamp gum (*Eucalyptus regnaris*), blue gum (*E. Globulus*), stringy bark (*E. obliqua*), and silver wattle (*Acacia dealbata*), none of which is suitable for paper pulp. Tasmanian manufacture of paper pulp for sale would not be a profitable undertaking.—*C. S. Gager.*

624. T., J. A. [Rev. of: Hutchins, D. E. **Waipona Kauri forest, its demarcation and management.** *63 p. Illus., map.* Lands and Survey Dept.: Wellington, New Zealand. 1918.] New Zealand Jour. Sci. Tech. 2: 223–224. 1919.—As now demarked by Hutchins, the Waipona forest is eleven miles long from east to west, and nearly nine miles broad from north to south, including 29,830 acres, of which 28,880 are occupied by the main block of forest. The total timber stand of the forest is estimated at 288,020,000 superficial feet of timber. A working plan for the forest is outlined. It is anticipated that the forest will become as well known in Australasia as the Black Forest is in Germany. [See also Bot. Absts. 6, Entry 569.] —*C. S. Gager.*

625. Terry, E. I. **Public acquisition or control.** Jour. Forestry 18: 324–325. 1920.—Differing from the plans so far proposed, it is believed the main objective of the United States forest policy should be the public acquisition of two-thirds of the private timber lands of the country within forty years.—*E. N. Munns.*

626. Tierney, D. P. **The cut-over land problem.** Jour. Forestry 18: 498–501. 1920.—There are no means at present adequate to safeguard the millions of acres of restocking forest land in the United States from indiscriminate cutting and waste. This is due to dependence of forest management upon annual appropriations from legislative bodies. More attention should be given to securing a known fund without having to persuade a legislative body to make this appropriation annually. A forest program should begin with restocking lands first, before acquiring lands on which forests will have to be established. Land purchases should be restricted to watershed-protection areas and lands close to areas now under forest management.—*E. N. Munns.*

627. Toumey, J. W. [Rev. of: Ise, John. **United States forest policy.** *395 p.* Yale Univ. Press: New Haven, 1920.] Jour. Forestry 18: 558–560. 1920.—The work is that of an economist and historian, who develops the history of the present policy without reservations. As to a future policy, too little consideration is given, especially with the present forestry-policy movement under way.—*E. N. Munns.*

628. Toumey, J. W. [Rev. of: Pulling, Howard E. **Sunlight and its measurement.** Plant World 20: 151–171, 187–209. 1918.] Jour. Forestry 18: 431–433. 1920.

629. Turner, J. E. C. **Lopping in the Kumaon Circle, United Provinces.** Indian Forester 46: 240–247. 1920.—Nomadic native tribes still practice destructive cutting of all live branches of oak for their flocks during heavy snowfall, when other browse is unavailable despite rules that permit only the cutting of the lower two-thirds of the branches. This is resulting in the destruction of the oak forest and of grazing values when practiced constantly. Recommendations are made to prevent such action.—*E. N. Munns.*

630. Vestby, P. **Spredte träk fra en skogbefaring i Chili. [Sketches from a trip to Chilian forests.]** Tidsskr. Skogbruk 28: 17–27. *Pl. 1.* 1920.

631. von dem Busche. **Schutz und Anbau der Eibe. [Protection and propagation of the yew.]** Deutsch. Forstzeitg. 35: 21. 1920.—An order from the Minister of Agriculture, Domains, and Forests, for preventing the extinction of yew in German forests.—*W. N. Sparhawk.*

632. von Mammen. **Forstwirtschaft, Holzhandel und Holzindustrie in Ostpreussen. [Forestry and wood industry in East Prussia.]** Forstwiss. Centralbl. 41: 368–388. 1919.—Wooded area in 1913 was 660,841 hectares, or 17.7 per cent of the land area. The forests were divided into 23,120 tracts, of which 22,942 were connected with farms, 84 per cent were under 10 hectares in size, and made up but 7.9 per cent of the total area; the 114 tracts greater than 1,000 hectares comprised 68.5 per cent of the total area. Deciduous species occupied 21.7 per cent of the area, or 143,305 hectares; two-thirds of this was high forest, divided into three types, oak, birch-alder-ash, beech and others, at about a 1–3–1 ratio. Conifers occupied 517,536 hectares (78.3 per cent) of which 96,132 *ha* were selection forest and the rest high forest. Scotch pine covered 338,629 *ha*, spruce 168,100 *ha*, white fir 10,524 *ha*, and larch 283 *ha*. Pine predominates on the sandy soils of the south, spruce on the loams in the northern and central districts, oak on the best soils, while hornbeam, birch, aspen, and linden are common in mixture with conifers on the better sites. Aspen and birch quickly occupy areas denuded of conifers. The forests suffer considerable losses from late and early frosts, storms, and insects,—timber cut from the State forests (386,000 *ha* in 1904, and 417,000 *ha* in 1912) increased from 4.14 cubic meters per hectare in 1904 to 11.75 cubic meters in 1910, due to ravages of the Nun-moth. In 1912 but 5.01 cubic meters per *ha* was cut, nearly half of it fuelwood. Yields of the larger private forests are about the same as those of state forests; the smaller private holdings are not managed as well, although steps have recently been taken to promote forestry on private holdings.—Before the war, wood exports consisted chiefly of firewood and mine timbers, to western Germany, construction material to Berlin and vicinity, and amounted in all to about 350,000 tons per year. More than 2,200,000 cubic meters of wood were imported from Russia to supply the sawmills and pulpmills in the Memel region. Rapid development of the sawmill industry in Russia has resulted in increased prices of raw material for the Memel mills, and at the same time in lower prices for manufactured lumber.—*W. N. Sparhawk.*

633. von Tubeuf, C. **Schilderungen und Bilder aus nord-amerikanischen Wäldern. [Descriptions and pictures of North American forests.]** Naturw. Zeitschr. Forst- u. Landw. 17: 153–166. *Pl. 54–59.* 1919.—This article is the second of a series; in it the author describes his trip over the Moffat Road to Idle-wild in the Arapaho National Forest, with reference chiefly to forest types encountered. He gives a brief account of the local organization of the U. S. Forest Service and some of its work. The virgin forests of lodgepole pine, pure or in mixture with alpine fir (*Abies subalpine*, he calls it) are considered in some detail. The system of management is far from intense as compared with German methods, only tie timber is logged, and regeneration is secured naturally, since Lodgepole is a very prolific seeder. A few attempts have been made by the Forest Service to reforest burnt-over areas artificially, where neither lodgepole nor aspen have come in. Aspen and lodgepole usually occupy the land after a fire; the latter most frequently following Douglas fir. The seed extraction establishment on the Arapaho Forest is described. The dendroctonus bark-beetles cause very much damage in this region. Their activities, according to Hopkins, are of a primary nature; not secondary, as the author considers the activities of German bark beetles. Although no direct evidences of insect damage were encountered, the writer was struck with the damage caused by the porcupine (*Erethizon dorsatum*) in lodgepole forests, and gives a description of this animal.—*J. Roeser.*

634. Whitford, H. N. [Rev. of: Brown, W. H., and A. F. Fisher. **Philippine bamboos.** Philippine Islands Bur. Forest. Bul. 15. *32 p., 33 pl.* Manila, 1918.] Jour. Forestry 18: 167–168. 1920.

635. WHITFORD, H. N. [Rev. of: BROWN, W. H., AND A. F. FISHER. **Philippine mangrove forest.** Philippine Islands Bur. Forest. Bull. 17. *132 p., 47 pl.* Manila, 1919.] Jour. Forestry 18: 166–167. 1920.

636. WHITFORD, H. N. [Rev. of: SKOTTSBERG, CARL V. **Die Vegetationsverhältnisse längs der Cordillera de los Andes S. von 41° S. Br.: Ein Beitrag zur Kenntnis der Vegetation in Chiloe, West-Patagonien, den Andinen, Patagonien und Feuerland. Botanische Ergebnisse der Schwedischen Expedition nach Patagonien und dem Feuerlande 1907–1909. (Vegetation of the Andean cordillera south of 41° South Lat., Chile, Patagonia and Tierra del Fuego. Botanical results of the Swedish expedition of 1907–09.)** *366 p.* Stockholm, 1916.] Jour. Forestry 18: 164–165. 1920.

637. WILSON, ELLWOOD. **The use of aircraft in forestry.** Amer. Forestry 26: 326–328. *4 fig.* 1920.

638. WIMBUSH, A. **Big teak in Madras.** Indian Forester 46: 247–249. *1 pl.* 1920.—An average volume of 317 cubic feet per tree was obtained from 111 teak trees, the maximum yield from one tree being 1,099 cubic feet.—*E. N. Munns.*

639. WOLFF, M. H. **Plan of relation of forest regulation to forest communities.** Jour. Forestry 18: 486–497. 1920.—The Coeur d'Alene National Forest (northwestern United States) can best be handled under a system of volume regulation with a sustained annual yield. With small working circles, the development and maintenance of local logging communities is assured. Dividing the forest into six areas, it is possible to develop the plan equally by pairing off the stands of poorer and relatively inaccessible material with the more accessible and high quality stands. The volume cut up to the present shows an apparent over cutting, but this is due to under-estimates of the stand, very conservative estimates of growth, and cutting in non-marketable blocks. It is expected that the annual yield figures of from seventeen to twenty million feet will vary greatly from year to year depending on transport, seasonal variations, logging fluctuations, and the cut from private lands outside the Forest. By maintaining this cut at a constant, the population depending on the industry will largely be stabilized and the communities assured.—*E. N. Munns.*

640. WOOD, LESLIE S. **The Mapledurham statistics.** Quart. Jour. Forest. 14: 49–59. 1920.—Yearly diameter measurements of sample areas in several tracts of beech woodland situated in South Oxfordshire, England, and actual volume measurements of trees felled in these woods, disclose some interesting variations in volume related to the density of the crop. In dense woods, due to increased height growth, the average cubic contents of trees of equal diameters is higher than in woods where the trees are widely spaced. The mean increment for a 7-year period for seven pieces of woodland varied from 1.81 per cent to 5.4 per cent and averaged 2.8 per cent. The increment of 1.81 per cent is for woodland where the trees stood too close and that of 5.4 per cent is for one where did they not stand close enough. The total increment per acre was not as large in either case as would have been secured through more judicious spacing. Trees 20 inches or less in circumference show a mean annual increment of 1.5 per cent as compared to 2.44 per cent for those over 20 inches in circumference. The smaller trees owe their slow growth partly to being suppressed and partly to being old stock and consequently slow growers. These figures favor the compartment system in beech woods, for under that system all the suppressed and slow-growing trees are removed and the best-growing trees are encouraged; the removal of the small trees automatically raises the percentage of growth of the larger trees.—*C. R. Tillotson.*

641. WOODBURY, T. D. **California forests and forestry.** Amer. Forestry 26: 262–267. *8 fig.* 1920.

642. WOOLSEY, THEODORE S., JR. **Fire protection in Portugal.** Jour. Forestry 18: 542–543. 1920.—The methods employed by the government, on a forest of 28,066 acres, are described.—*E. M. Munns.*

643. WOOLSEY, THEODORE S., JR. **Prevention of forest devastation.** Jour. Forestry 18: 326-328. 1920.

644. WOOLSEY, THEODORE S., JR. [Rev. of: GOBLET D'ALVIELLA, FELIX. **Elements de sylviculture.** *Vol. 1, 383 p.; Vol. 2, 269 p.* Marcel Reviere: Paris, 1919.] Jour. Forestry 18: 296-297. 1920.

# GENETICS

G. H. SHULL, *Editor*
J. P. KELLY, *Assistant Editor*

645. ÅKERMAN, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116-127. *6 fig.* 1920.

646. ÅKERMAN, Å., HJ. JOHANSSON, AND B. PLATON. **Fortsatta undersökerningar rörande suckerhalt och torrsubstanshalt hos några höstvetesorter. [Continued examinations on the percentage of sugar and dry-substance in some varieties of winter wheat.]** Sveriges Utsädesf. Tidskr. 28: 216-224. 1918.—Continuation of senior author's work on winter killing and frost resistance. [See Bot. Absts. 5, Entry 254.]—*K. V. Ossian Dahlgren.*

647. ALTENBURG, EDGAR, AND HERMANN J. MULLER. **The genetic basis of truncate wing,—an inconstant and modifiable character in Drosophila.** Genetics 5: 1-59. *1 fig.* Jan., 1920.—Truncate wing is an inconstant character varying from short truncate to normal. It is still modifiable after 100 generations of selection, and even the best truncate lines threw 10 per cent of normals. The variation is both somatic and genetic, and there is a close resemblance to the cases quoted in favor of factorial inconstancy. Yet a detailed analysis shows that the genetic variation is due to sorting out of factors, not to fluctuation of individual genes; since when the genetic constitution was maintained constant in a new type of "pure line" experiment carried out by means of "identifying factors," selection was without effect.—The truncate character is due to several factors, at least one in every chromosome except the fourth. The main factor, without which the character rarely appears, is in the second chromosome. This factor is lethal when homozygous, hence the impossibility of obtaining a pure stock. The low number of normals thrown in selected stocks is due to a "balancing" lethal in the opposite chromosome, which kills off the normals (except those that escape by crossing over). The truncate factor in the third chromosome reduces the fertility of females homozygous for it, thus also preventing the obtaining of pure stock. The first chromosome factor is not lethal and does not reduce the fertility.—The authors point out the applicability of the method of "identifying factors" to other complex genetic cases, as in human heredity.—*Alexander Weinstein.*

648. ANDERSON, W. S. **Bloodlines of genetic value.** Science 52: 41. July 9, 1920.—Author's abstract of paper read before seventh annual meeting of the Kentucky Academy of Science, Lexington, May 8, 1920:—In the domestic breeds of live stock great sires seldom produce more than one or two sons that are greater progenitors than themselves. This means, in blooded stock, that the greatness of any given blood line is handed on by one or two in any one generation, the others of the generation merely add members. In support of the statement, the great sires of nine breeds of domestic animals were cited and the few sons of each were named who have been instrumental in handing on the breeds.—*W. S. Anderson.*

649. ANONYMOUS. **Death of W. Schallmayer.** Jour. Heredity 11: 155. April, 1920.

650. ANONYMOUS. **Moral qualities and eugenics.** Jour. Heredity 11: 189. April, 1920.

651. ANONYMOUS. **Were the black-and-white Holsteins originally red-and-white?** Jour. Heredity 11: 155. April, 1920.

652. Bateson, W., and Caroline Pellew. **The genetics of "rogues" among culinary peas (Pisum sativum).** Proc. Roy. Soc. London 91: 186–195. May 12, 1920.—Summarizes data on genetics of "rogues" in peas published in 1914. Gives details of further experiments. Finds: (1) reciprocal crosses between type and rogue give plants which, as they develop, turn into rogues. (2) Though characters of type are introduced and manifest their presence by affecting form of young $F_1$ plant, they very rarely take part in germ-lineage, being apparently left behind in the lower nodes. (3) Plants really intermediate between type and rogue exist, but never breed even approximately true. Their germ-cells may be either type, intermediate (2 kinds at least), or rogue. Proportion of gametes carrying type-characters is different on male and female sides, the ratio in both sexes showing gradational change.—Egg-cells of lower flowers, up to about 10th flowering node in more than 50 per cent of cases carry type-characters—at least the non-pointed character—above which level, proportion declines. Only about 20 per cent of pollen in lowest two flowers is type-bearing, and above this level, in each successive flower, the proportion of type-bearing pollen rapidly diminishes. Discusses somewhat comparable cases of Biffen with gray chaff character in wheat crosses; of Ikeno with variegated *Capsicum* crossed with green type, with no recovery of former in later generations; of Baur's interpretation of data obtained from crosses between white-skinned and green plants, and of Winge's observations on *Humulus*, where slightly variegated lower leaves, subsequently became green. Of all these, Winge's case is said to be the most comparable. Weak growth on type plants in peas does not specially favor appearance of rogue characters, and rogues even when most luxuriant, do not produce types. No Mendelian system applicable in such cases, but genetic differences in germ plasm undoubtedly exist. No clear discontinuity. Two sorts of intermediate gametes must exist—one more type-like and one more rogue-like. Numerical chromosome differences between rogue and type do not exist, each having seven in haploid cells. Comments on long-held belief of practical breeders and conventional evolutionists that when selection ceases, a breed degenerates. As regards rogue character in peas, this is true, although not true for any other known genetically studied case, so far as the writers know.—*Orland E. White.*

653. Bauer, J. **Aufgaben und Methoden der Konstitutionsforschung. [Problems and methods of study of the constitution.]** Wiener klin. Wochenschr. 1919.

654. Baur, E. **Einführung in die experimentelle Vererbungslehre. [Introduction to genetics.]** *3rd & 4th ed., 410 p., 10 colored pl., 142 fig.* Gebrüder Bornträger: Berlin, 1919.

655. Bergman, Emanuel. **A family with hereditary (genotypical) tremor.** Hereditas 1: 98–106. *2 fig.* 1920.

656. Čamek, Josef. **Investigations of the hair of different breeds of cattle.** Jour. Agric. Sci. 10: 12–21. Jan., 1920.—Investigations of hair of different European breeds of cattle showed that in pure-bred animals maximum length of hair is found between the ages of 6 months and 2 years, and that older animals have shorter hair. The hair of bulls is always longer than that of cows and oxen of the same age. The white hair of an animal is shorter than the colored. The diameter of the hairs is less for cattle up to 3 months and the greatest diameter is reached by animals between 1 and 2 years of age. Males have hair of greater diameter than do females. The white hair of an animal is of less diameter than colored. In general, diameter increases with length. In short hair the diameter is relatively greater than in long ones. With bulls the ratio of diameter to length is smaller than in cows and heifers of the same age. The ratio is greater in white hair. Food is without influence on diameter.—Ash content of hair depends on pigmentation, age, sex, and possibly food. Colored hair contains more ash than white and also more iron. Ash is also greater in black than in brown or red hair.—*Elmer Roberts.*

657. Chodat, R. **La panachure et les chimères dans le genre Funkia. [Variegation and chimeras in the genus Funkia.]** Compt. Rend. Soc. Phys. Hist. Nat. Genève 36: 81–84. 1919.

658. Cook, O. F. **Cotton a community crop.** Jour. Heredity 11: 174–177. April, 1920.

659. Correns, C. **Die geschlechtliche Tendenz der Keimzellen gemischtgeschlechtiger Pflanzen.** [**Sex tendency of germ-cells in plants of mixed sex.**] Zeitschr. Bot. 12: 49–60. *2 fig.* 1920.

660. Coulter, J. M. **Mutation.** [Rev. of: Constantin, J. **La mutation. État actuel de la question. (Mutation. Present status of the question.)** Ann. Sci. Nat. Bot. X. 1: iii–xxix. 1919. (See Bot. Absts. 4, Entry 552.)] Bot. Gaz. 69: 535. June, 1920.

661. Coulter, M. C. [Rev. of: East, Edward M., and Donald F. Jones. **Inbreeding and outbreeding.** *14 × 21 cm. 285 p., 46 fig.* J. B. Lippincott, Philadelphia, 1919. (See Bot. Absts. 4, Entry 571.)] Bot. Gaz. 69: 530–532. June, 1920.

662. Cowgill, H. B. **Report on tomato and melon breeding.** Ann. Rept. Insular Exp. Sta. Porto Rico 1917–18: 96–98. 1919.—Tomato hybrids: Original cross was between vigorous local Cherry tomato and Livingston Globe; purpose to secure disease-resistant tomato of good quality suitable to conditions of Porto Rico. $F_1$ plants were intermediate in many prominent characters. In $F_2$ 318 plants were grown, many closely resembling one or other of parents, majority more like Cherry parent. These were in general strong growers and resistant to unfavorable conditions. Partial inverse correlation was noticed between number of fruits in inflorescence and size of fruits; large majority of fruits were shorter in polar diameter than equatorial, which is not true of either parent. Size is at least partially independent of number of cells. No plants had all fruits two-celled like Cherry parent, though some had majority two-celled. Many plants were very promising as to vigor of growth, prolificacy and disease-resistance.—Melon hybrids: $F_1$ of crosses between local oblong melon with soft rind (pistillate parent) with Hybrid Casaba and Honeydew (staminate). Both of latter have hard rind and are susceptible to downy mildew, though female parent is resistant. Hybrid offspring appeared very resistant, and flavor of fruit was good. Hybrids were more precocious and prolific than local melon. Where Casaba was used as male parent offspring were pyriform and grooved and rough-skinned; when Honeydew was pollen parent hybrid fruits were smooth-skinned, oval and faintly grooved or without grooves.—*E. E. Barker.*

663. Cowgill, H. B. **Report of the division of agronomy and plant breeding.** Ann. Rept. Insular Exp. Sta. Porto Rico 1917–1918: 78–95, 98–104. 1918.—Work with seedling sugar canes was continued to secure several types necessary for different ecological areas of Porto Rico. Several promising new seedling varieties were selected after 3 or 4 years trial. Studies were made of distinguishing botanical characters of cane varieties. 37 crosses were attempted, 15 with success, yielding 1794 seedlings. Otaheite and Crystallina were used as seed parents and B-4596, B-347, B-3412, D-117, D-109, and P. R.-207 as pollinators. Viability of nearly all varieties, either crossed or open-pollinated, was relatively low; 45 flats planted with open-pollinated seeds of 6 varieties yielded 5200 seedlings. Describes 6 varieties produced by cross-pollination in 1916. From 1917 seedlings 36 selections were made, 12 from 1914, or 35.5 per cent of that year's seedlings and 4 or 26.6 per cent of 1913 seedlings were selected. These were all planted in $\frac{1}{10}$ acre plots for comparison with Crystallina. They are now ready to be tested in other parts of Porto Rico. Descriptions of 10 are given. 1912 seedlings were nearly all retained for trial; tables of their yield and analysis are given. Foreign varieties tested for disease resistance on infested soils found all to be susceptible, though some showed varying degrees of resistance. 1500 seedling canes in pots sent to Centrale Coloso and planted in disease infested field, became so badly infected with mottling disease that all were plowed up.—*E. E. Barker.*

664. Darrow, Geo. M. **Are our raspberries derived from American or European species?** Jour. Heredity 11: 179–184. *4 fig.* April, 1920.

665. de Vries, E. **Versuche über die Frucht- und Samenbildung bei Artkreuzungen in der Gattung Primula. [Study on fruit and seed formation in species crosses of the genus Primula.]** Recueil Trav. Bot. Néerland. 16: 63–203. 1919.—See Bot. Absts. 6, Entry 739.

666. Dufour, L. [Rev. of: Daniel, L. **Les symbiomorphoses; nouvelles recherches sur l'hybridation asexuelle. (The symbiomorphoses; recent investigations on asexual hybridization.)** Revue bretonne de Botanique pure et appliquée, 1917.] Rev. Gén. Bot. [Paris] 30: 367–368. 1918.—The term "symbiomorphosis" is applied to the diverse modifications of plants verified as the result of grafting. Two cases are distinguished according as the grafts are between different species or upon hybrids.—(1) Grafts between different species of cacti, vines and conifers are mentioned with the peculiar modifications produced. The cabbage when grafted on the tomato exhibited two tomato characters viz., an internal medullary liver and extremely thin crystals of calcium oxalate in the cells. (2) Under symbiomorphoses among hybrids three kinds of effects are described in specific instances viz., returning to the parental types (pears, vines); attenuation or reinforcement of characters (vines); occasional reappearance of ancestral characters (vines). Author's conclusion: "in the same graft one may encounter variations of diverse origin which are blended together or which encroach upon one another. In general, symbiomorphoses are almost always a resultant complex (globale) of numerous physical, chemical and physiological factors."—*E. B. Babcock.*

667. East, E. M. **Hybridization and evolution.** Amer. Nat. 54: 262–264. May–June, 1920.—The two species, *Nicotiana rustica* and *N. paniculata*, fall into distinctly different groups of the genus, yet partially fertile hybrids have been obtained by crossing them, the $F_1$ generation being intermediate and as uniform as either parent. Few of the gametes are viable, yet the $F_2$ generation is inordinately variable, which indicates that the two species differ in an extremely large number of inherited factors. The factors for normal fertility recombine in the Mendelian sense just as do the factors for other characters, so that highly fertile strains can be selected some of which are more unlike than the two original species. *Eight of these strains were crossed in all possible combinations and every $F_1$ generation exhibited as high a degree of fertility as that shown by the parents.*—Lotsy's theory of evolution through hybridization, founded on the study of crosses in *Nicotiana, Pisum, Petunia* and *Antirrhinum*, which gave results comparable with the above, was based on assumptions which are open to numerous criticisms. Yet hybridization has played some part in evolution and it is important to determine the limits of its rôle. Author's observations suggested to him that the $F_2$ generations arising from partially sterile $F_1$ interspecific hybrids might furnish much of the variability required for evolution under domestication, the chief cause of which is shown by both historical and experimental evidence to be hybridization of species. But evolution under domestication must not be confused with natural evolution. The perfect fertility within groups of domestic animals and cultivated plants stands in contrast to the marked sterility between the great majority of natural species. Author's evidence and observations on domestic forms yield no indication of a tendency toward production of segregates that exhibit either incompatibility in crosses or sterility of hybrid offspring.—*E. B. Babcock.*

668. Eriksson, J. **Platanthera bifolia × montana i Blekinge. [Platanthera bifolia × montana in Blekinge** (Sweden).] Bot. Notiser 1918: 59–62. 1918.—At some few places in Blekinge this hybrid has been found. Its appearance and occurrence are given. The flowers are, as in *Platanthera montana*, scarcely nice smelling. The fruits nearly always fail to develop.—*K. V. Ossian Dahlgren.*

669. Federley, H. **Ärftlighetsforskningens resultat tillämpade på manniskan. [Results of genetical science applied to mankind.]** Studentföreningens Verdandls Småskrifter no. 218. *47 p., 22 fig.* A. Bonnier: Stockholm, 1918.—A lecture read at a meeting of the Swedish Eugenical Society. The following matters are treated: The biometrical school, Mendelism, Mendelian characters of man, the cytological basis of heredity, sex and the chromosomes, the sex-limited type of heredity, and the social importance of genetical science.—*K. V. Ossian Dahlgren.*

670. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel, Erdbirne, Lein, Hanf, Tobak, Hopfen, Buchweizen, Hülsenfruchtern und kleeartigen Futterpflanzen. [Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops, buckwheat, legumes and clover-like forage plants.]** *3rd ed., 240 p., 45 fig.* Paul Parey: Berlin, 1919.—See also Bot. Absts. 6, Entry 725.

671. Galant, S. **Über die Entstehung von Variationen bei Anemone hepatica. [Origin of variations in Anemone hepatica.]** Biolog. Zentrabl. 39: 529–535. Dec., 1919.

672. Gillies, C. D. **Variation of sepals of Bruguiera Rheedii Blume.** Proc. Roy. Soc. Queensland, 30: 95–96. 1918. [Issued Dec. 21, 1918.]

673. Goldschmidt, Richard. **Die quantitative grundlage von Vererbung und Artbildung. [The quantitative basis of heredity and species formation.]** *163 p., 28 fig.* Julius Springer: Berlin, 1920.

674. Hadley, Philip, and Dorothy W. Caldwell. **Studies on the inheritance of egg-weight. I. Normal distribution of egg-weight.** Rhode Island Agric. Exp. Sta. Bull. 181. *64 p., 43 fig.* Jan., 1920.—An unselected, homogeneous group of 39 White Plymouth Rock pullets was the original stock, to which no new blood was added. These were subsequently divided into a large-egg, and small-egg group. Individual hens showed a marked conservation in the weight of their eggs. The first eggs in a laying year were smaller than those which followed, a maximum being reached in April, a minimum in July or August, a second maximum in September and a second minimum in November or December. In and after the fourth laying year the mean egg-weight continued to decrease during the eight years. The results were inconclusive regarding the relation between body-weight and egg-weight. No correlation was shown between body-weight and total egg-weight. There was a tendency for hens possessing higher mean egg-weights and heavier "maximum" eggs to produce a first egg of greater weight.—*B. L. Hartwell.*

675. Hagiwara, Tokio. **On the coupling of two leaf characters in the Japanese morning glory.** Bot. Mag. Tokyo 34: 17–18. *3 tables.* Mar., 1920.—Describes crosses between a race with variegated up-rolled leaves with two others with flat green leaves. Variegation and rolling are due to recessive factors but show a certain degree of coupling. Taken separately each gives a very close approximation to a 3:1 ratio but considered together the numbers were as follows:—252 flat green : 26 rolled green : 27 flat variegated : 69 rolled variegated, where the expectation on the basis of complete independence would have been for a 9:3:3:1 ratio. The numbers actually found are thought by the author to accord well with the assumption of a gametic gatio of 7:1:1:7 (after Bateson and Punnet's hypothesis), which would theoretically yield 258.4 flat green: 21.7 rolled green: 21.7 flat variegated: 70.4 rolled variegated. Crossover percentages are not calculated or in fact considered.—*Leonas L. Burlingame.*

676. Harland, S. C. **Studies of inheritance in cotton. I. The inheritance of corolla colour.** West Indian Bull. 18: 13–19. 1920.

677. Harrison, J. W. Heslop. **Genetical studies in the moths of the geometrid genus Oporabia (Oporinia) with a special consideration of melanism in the Lepidoptera.** Jour. Genetics 9: 195–280. *13 fig.* Feb., 1920.—The heath-feeding geometrid subspecies *Oporabia filigrammaria* (37 pairs of chromosomes) was derived from *O. autumnata* (38 pairs of chromosomes) of birch, alder, larch or pine. "This event was caused during the Glacial period by the action, direct and indirect of changed climatic conditions." Eggs of the heather insect hatch much earlier in the spring and imagines appear a month earlier; its larvæ may be raised on the food plants of the other species, but are never found upon moorland birch, alder, larch. The preference for heather is due to "long years of compulsory oviposition on these plants" that "have so affected the organism that the habit has been impressed germinally." Raised on

birch and alder and inbred for 5 seasons, *filigrammaria* showed no characters of the birch-alder-larch-eating *autumnata*.

A local larch-pine race of *autumnata* has developed in Wilton Wood, Yorkshire, since moorland reforestation about 1800; a neighboring isolated larch forest (Normanby Intake) was destroyed in 1885 and birches came in. Larch-feeding insect of Wilton is smaller, duller, feebly marked, a month earlier than the more typical birch-feeding Normanby form. But the birch instinct has not been lost in the Wilton variety. Birch feeding restores original size, though natural selection by bats, owls and night-jars has tended to eliminate pale, silvery variants in favor of darker and feebly-marked. Earlier emergence of larchwood race is due to gradual fall of temperature under extremely cool moist conditions of the dense larch forest in contrast with dryer, more open birch woods. In evidence, pupæ exposed to a gradual fall in *low* temperatures emerged earlier than others exposed to a similar fall at higher temperatures. Caterpillars of larchwood stock fed on birch produced imagines indistinguishable from their own race in color and early time of emergence (1), but of larger size.

A local brilliant silvery variety of *O. dilutata* is found in an isolated oak wood cut off by a ridge 1000 feet high from the nearest oaks, ¾ mile distant, where "the ordinary suffused melanic form" occurs.—The increasing prevalence of melanism of moths near English industrial centers is ascribed to "changed metabolism favoring resistance to, or actually induced by, the use of food contaminated with metallic salts and other compounds. Exhaustive daylight observations on *Polia chi* showed that no natural selection favorable either to dark or light forms occurred, although natural selection is not entirely ruled out.—Melanism in *Oporabia* is non-Mendelian. A persistent blend occurs.—A ♀ mutation of *autumnata*, "*latifasciata*," with barred wings, behaves as a sex-linked (partial) dominant, heterozygous for sex. Crossed with recessive type ♂, a sex criss-cross results (♂♂ heterozygous, *latifasciata*; ♀♀ recessive type). Heterozygous dominant $F_1$ ♂ (Z′Z, using Morgan's symbols, Z′ being chromosome carrying *latifasciata* gene) mated with the recessive type ♀ (WZ), either of $F_1$ or of wild stock, gave heterozygotes and recessives of each sex in equal numbers (*latifasciata* ♀♀ and ♂♂ + type ♀♀ and ♂♂, i.e., $WZ' + Z'Z + WZ + ZZ$). Recessive $F_1$ type ♀ mated with type ♂ bred true.—Crosses between *O. autumnata* and *dilutata* are probably sex-linked, though it is suggested that, since the latter has only 30 pairs of chromosomes instead of 38, "mitotic anomalies" may explain the phenomena. Great disturbances in development occurred: (1) ♀♀ from *autumnata* ♀ × *dilutata* ♂ emerged three months before the males and had no ovaries, (2) *dilutata* ♀ × *autumnata* ♂ produced few females, never more than one per brood, but fertile and like *autumnata*. Lack of viability is manifest in pupæ. Though both reciprocal $F_1$ hybrid ♂♂ are fertile, back-crossing never produced adults. No synapsis, nor reduction division, occurs. A larva with wings appeared in $F_1$ ex *autumnata* ♀ × *dilutata* ♂. Bacterial disease delays gametogenesis and hence emergence, but precocious ovariless ♀♀ of *O. autumnata* ♀ × *dilutata* ♂, though infected, appeared at their accustomed time.—Hybrids between *autumnata* and *filigrammaria* are a blend, no segregation appearing in $F_2$ nor in back-crosses, but in $F_3$ "a delayed or pseudo-segregation is manifested in which a portion of the brood still remains intermediate whilst the remainder appeared in a uniform pseudo-mutational guise," recalling behavior of *Oenothera Lamarckiana*. No segregation of marked size-differences of parents in support of multiple factor theory. A female with three antennæ appeared in intermediate portion of $F_3$ lot. Back-crossing $F_1$ (blend) with *autumnata* produced in first generation *autumnata*, but in back-crossing with *filigrammaria* two generations are necessary to bring hybrids back to pure *filigrammaria* facies. Reduction division of $F_1$ *filigrammaria* ♀ × *autumnata* ♂, involving 37 × 38 chromosomes (haploid numbers) is nearly perfect. Crosses between *filigrammaria* and *dilutata* failed, apparently through lack of physiological affinity. Ova from *Cheimatobia boreata* ♀ × *O. autumnata* ♂ failed to hatch. No ova from reciprocal cross, nor from *C. brumata* × *O. autumnata*.—*John H. Gerould.*

678. Heal, John. **Streptocarpus hybrids.** Gard. Chron. 67: 293. June 12, 1920.—Breeding of *Streptocarpus* is modern, but many advances have been made in late years. Greenhouse races originated from Kew hybrids. First flowers were comparatively small, on short

stems with few colors and foliage long and ungainly. Continued selection and crossing brought compact habit, shorter foliage, shades of color ranging from white through rose, pink to salmon, red, violet and blue, also yellow, remarkable floriferousness, long succession of bloom, lasting quality of flowers and numerous handsome habit types. Many species have been used in hybridization work. Names given. Flowers of some varieties reach 4.5 inches and have long stems. Color races are fixed and breed true. Detailed description of culture is given. Seedlings flower in seven months.—*Orland E. White.*

679. Heribert-Nilsson, N. **Zuwachsgeschwindigkeit der pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana. [Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.]** Hereditas 1: 41–67. *1 fig.* 1920.

680. Hertwig, Paula. **Haploide und diploide Parthogenese. [Haploid and diploid parthenogenesis.]** Biol. Zentralbl. 40: 145–174. April-May, 1920.

681. Honing, J. A. **Selection studies with Deli tobacco.** Teysmannia 30: 1–11. *2 pl.* 1919.

682. Hooper, J. J. **A study of inheritance of coat colors in Jersey cattle.** Science 52: 43. July 9, 1920.—Author's abstract of paper read before Seventh Annual Meeting, Kentucky Academy of Science, Lexington, May 8, 1920: Studies of inheritance of Jersey cattle coat colors by the author show that white spots are recessive to dominant solid color, and a white tongue and tail-switch also are recessive. Colors of 1145 calves were tabulated and compared with those of their 2290 sires and dams. Some bulls studied seemed to be pure dominants, as their calves were all solid in color, although as many as a hundred were sired by each bull. It was found that 66 per cent of Jersey cattle are solid in color and have black tongue and switch, while 12 per cent are broken and have white tongue and switch; 3.6 per cent are solid and have white tongue and black switch, etc.—*J. J. Hooper.*

683. Hume, A. N. **A system for breeding corn or gregarious animals.** Jour. Heredity 11: 191-192. April, 1920.

684. Ikeno, S. **Études d'hérédité sur la réversion d'une race de Plantago major. [Genetical studies on reversion in a race of Plantago major.]** Rev. Gén. Bot. 32: 49–56. 1920.—Author reports on variety of *P. major* called *contracta* with leaves rounder, smaller and thicker, and spikes much shorter than in typical *P. major*. Crossings of *contracta* and the type led to an $F_2$ of 2525 typical : 826 *contracta*. Inbred *contracta* gave 3 per cent of plants like typical *P. major*; these reversions proved heterozygous and gave 3 typical to 1 *contracta* on selfing. Author discusses possible place or time at which the reversionary mutation in *contracta* gene occurred.—*James P. Kelly.*

685. Jones, D. F. **Heritable characters of maize. IV. A lethal factor—defective seeds.** Jour. Heredity 11: 161–167. *7 fig.* April, 1920.

686. Jost. [German rev. of: Lehmann, Ernst. **Über die Selbststerilität von Veronica syriaca. (On the self sterility of Veronica syriaca.)** Zeitschr. indukt. Abstamm. Vererb. 21: 1–47. *1 fig.* May, 1919. (See Bot. Absts. 3, Entry 2159.)] Zeitschr. Bot. 12: 87. 1920.—See also Bot. Absts. 6, Entry 695.

687. Kappert, H. **Über das Vorkommen vollkommener Dominanz bei einem quantitativen Merkmal. [The occurrence of complete dominance in a quantitative character.]** Zeitschr. indukt. Abstamm. Vererb. 22: 199–209. *1 fig.* Mar., 1920.—In two varietal crosses of peas—Laxtons Vorbote × William Hurst and Mammuterbse × William Hurst—the author found no significant difference between homozygous tall and heterozygous tall plants with respect to the following characters: total height of plant, average length of internodes, and number of internodes. Data are presented on a small $F_2$ and $F_3$ population for one cross and on a somewhat larger $F_2$, $F_3$, and $F_4$ population for the other.—*R. J. Garber.*

688. Koch, L. **Uitkomsten van eenige selectienproeven met padi. [Results with some selection experiments with rice.]** Korte Ber. uitgaande van den Landbouwvoorlichtingsdienst van het Departement van Landbouw, Nijverheid en Handel. Selectie—en Zaadtuin te Buitenzorg. No. 21. *16 p.* July, 1919.—In the last series of trials made in 1916–1919, pure strains were in 4 cases compared with the original population and with mixtures of pure strains. In 6 out of 10 trials the strains yielded more than the population. In 8 out of 10 trials the mixture of pure strains yielded more than the population. In 7 out of 10 trials the mixture of pure strains yielded more than the pure strains planted singly.—All trials combined the conclusion is reached, that pure strains may in some cases yield more than the population but almost always in later years the former fails in superiority to the latter. Pure-line breeding is unsatisfactory under such variable conditions as found in Java for the annual crops here considered.—*L. Koch.*

689. Kooiman, H. N. **Eenige opmerkingen naar aanleiding van Lotsy's artikel, "De Oenotheren als kernchimeren." [Remarks on the introduction of Lotsy's article "The Oenotheras as nuclear chimeras."]** Genetica 2: 235–243. May, 1920.—See Bot. Absts. 6, Entry 1092.

690. Kooiman, H. N. [Dutch rev. of: Collins, E. J. **Sex segregation in the Bryophyta.** Jour. Genetics 8: 139–146. *Pl. 6, 5 fig.* June, 1919. (See Bot. Absts. 3, Entry 2103.)] Genetica 2: 253. May, 1920.

691. Kooiman, H. N. [Dutch rev. of: Fruwirth, C. **Die Umzüchtung von Wintergetreide in Sommergetreide. (The breeding of winter cereals into spring cereals.]** Zeitschr. Pflanzenzücht. 6: 1–46. Mar., 1918. (See Bot. Absts. 1, Entry 1204; 2, Entry 935.)] Genetica 2: 255. May, 1920.

692. Kooiman, H. N. [Dutch rev. of: Harland, S. C. **Inheritance of certain characters in the cowpea (Vigna sinensis).** Jour. Genetics 8: 101–132. *1 fig.* April, 1919. (See Bot. Absts. 3, Entry 1003.)] Genetica 2: 259–260. May, 1920.

693. Kooiman, H. N. [Dutch rev. of: von Tschermak, E. **Bastardierungsversuche mit der grünsamigen Chevrier Bohne. (Hybridization studies with the green-seeded Chevrier bean.)** Zeitschr. Pflanzenzücht. 7: 57-61. June, 1919.] Genetica 2: 277-278. May, 1920.

694. Krause, K. [German rev. of: Bally, Walter. **Die Godronschen Bastarde Zwischen Aegilops- und Triticumarten. Vererbung und Zytologie. (The Godronian hybrids between species of Aegilops and Triticum. Heredity and cytology.)** Zeitschr. indukt. Abstamm. Vererb. 20: 177–240. *4 fig.* Feb., 1919.] Bot. Jahrb. 56: 5–6. 1920.

695. Krause, K. [German rev. of: Lehmann, Ernst. **Über die Selbststerilität von Veronica syriaca. (On the self sterility of Veronica syriaca.)** Zeitschr. indukt. Abstamm. Vererb. 21: 1–47. *1 fig.* May, 1919. See Bot. Absts. 3, Entry 2159.] Bot. Jahrb. 56: 6. 1920. See also Bot. Absts. 6, Entry 686.

696. Laughlin, Harry H. **Illustrating the structure and mathematics of the human germplasm.** Jour. Heredity 11: 185–189. *1 fig.* April, 1920.

697. Lehmann, Ernst. **Neure Oenotherenarbeiten. (Sammelreferat II.) [New work with Oenothera. (Composite review II.)]** Zeitschr. Bot. 12: 61–85. *14 fig.* 1920.

698. Lehmann, E. [German rev. of: Correns, C. **Die Absterbeordnung der beiden Geschlechter einer getrenntgeschlechtigen Doldenpflanze. (Trinia glauca) (Order of death of the two sexes in a dioecious umbelwort (Trinia glauca).)** Biol. Zentralbl. 39: 105-122. *3 fig.* Mar., 1919. (See Bot. Absts. 3, Entry 2105.)] Zeitschr. Bot. 12: 86. 1920.

699. Lehmann, E. [German rev. of: von Ubisch, G. **II. Beitrag zu einer Faktorenanalyse von Gerste. (Second contribution to a factorial analysis of barley.)** Zeitschr. indukt. Abstamm. Vererb. **20**: 65–117. *7 fig. 11 diagrams.* Jan., 1919.] Zeitschr. Bot. **12**: 171–172. 1920

700. Levine, C. O. **Native horses and cattle in the Orient.** Jour. Heredity **11**: 147–155. *Frontispiece, 4 fig.* April, 1920.

701. Ljung, E. W. **Svalöfs förädlade Vasaråg. [Svalöfs improved Vasa-rye.]** Sveriges Utsädesf. Tidskr. **28**: 71–81. 1918.—Describes a new rye variety obtained in Sweden by selection from Common Vasa-rye.—*K. V. Ossian Dahlgren.*

702. Lotsy, J. P. **Oenothera-proeven in 1919. [Oenothera experiments in 1919.]** Genetica **2**: 200–213. *5 fig.* May, 1920.

703. Lotsy, J. P. **Theoretische steun vòor de Kruisings-theorie. [Theoretical basis for the theory of the origin of species through hybridization.]** Genetica **2**: 214–234. May, 1920.

704. Lotsy, J. P. [Dutch rev. of: de Lint, G. M. **Over de verspreiding van Eurytemora affinis Poppe en Eurytemora hirundoides Nordquist in Nederland. (Distribution of Eurytemora affinis Poppe und Eurytemora hirundoides in Netherlands.)** Mededeel. Wetenschap. Vergader. Nederl. Dierk. Ver. 1919.] Genetica **2**: 264–266. May, 1920.

705. Lotsy, J. P. [Dutch rev. of: Semon, Richard. **Über das Schlagwort "Lamarckismus." (On the catch-word "Lamarckism.")** Zeitschr. indukt. Abstamm. Vererb. **22**: 51–52. Dec., 1919.] Genetica **2**: 269–271. May, 1920.

706. Lotsy, J. P. [Dutch rev. of: von Tschermak, E. **Beobachtungen über anscheinende vegetative Spaltungen an Bastarden und über anscheinende Spätspaltungen von Bastardnachkommen, speziell Auftreten von Pigmentierungen an sonst pigmentlosen Deszendenten. (Observations on apparent vegetative splitting in hybrids, and on apparently belated splitting in hybrid offspring, especially the occurrence of pigmentation on otherwise pigmentless descendants.)** Zeitschr. indukt. Abstamm. Vererb. **21**: 216–232. *1 fig.* Nov., 1920.] Genetica **2**: 278–284. May, 1920.

707. Lundborg, H. **Hereditary transmission of genotypical deaf-mutism.** Hereditas **1**: 35–40. 1920.

708. MacDowell, Edwin Carleton. **Bristle inheritance in Drosophila. III. Correlation.** Jour. Exp. Zoöl. **30**: 419–460. *8 fig.* May 20, 1920.—Author analyses the data presented in two earlier papers by means of the correlation table. He also studied four more unselected generations of same strain. The former data consisted of 49 generations of selection for high bristle number in a strain of *Drosophila melanogaster*. His former conclusions were as follows: (1) Extra bristles behaves as a simple Mendelian character when crossed to the wild. (2) Selection was effective for a few generations and then ceased. (3) Selection was effective because genetic differences existed among the germ-cells of the original extra-bristled flies. (4) Selection ceased to be effective when the strain became homozygous. (5) There was no evidence of germinal changes during selection. (6) The character was dependent to a large extent upon the food.—By means of the correlation table he finds that the generations can be divided roughly into three groups: 1, generations 2 to 10; 2, generations 11–34; 3, generations 35 to 49. In the first group the correlation coefficients are generally significant and positive; in the second group they fluctuate, some being negative; in the third group the only significant coefficients are negative. The author believes the fluctuations in the second group due to non-genetic causes. It is only in the first group that he gets unquestionable positive correlation. It was during this period that the means indicated that selection was effective. Hence by the present method of analysis the author is forced to the same conclusions as in

his earlier papers.—The analysis of the four unselected generations at the end of the selected line showed that high and low grade parents gave rise to the same grade of offspring. Hence the strain was homozygous.—*F. Payne.*

709. Muller, H. J., and E. Altenburg. **The rate of change of hereditary factors in Drosophila.** Proc. Soc. Exp. Biol. Med. 17: 10-14. 1919.—Rate of mutation in *Drosophila melanogaster* was determined by observing rate of occurrence of sex-linked lethals, because lethal mutations are much more frequent than non-lethals. (In the present experiment, in which 33 lethals—of which 4 or 5 were semi-lethals—were observed, no non-lethal mutations were noticed.)—Sex-linked lethals were found to occur in 5 out of 445 females (1 in 90) at 66°F., and in 13 out of 517 females (1 in 40) at 80°F. The value for $Q_{10}$ for mutation is, on this basis, between 2 and 3, as is usual for chemical reactions. The average rate of mutation was 1 in 53. This would mean that one fly in every 13 should contain a lethal mutation in some chromosome or other. A new lethal should occur in each X chromosome once in every 100 generations (4 years), and each individual factor should mutate on the average not oftener than once in 2000 years.—*Alexander Weinstein.*

710. Nienburg. [German rev. of: (1) Bensaude, Mathilde. **Recherches sur le cycle évolutif et la sexualité chez les Basidiomycètes. (Researches on the evolutive cycle and sexuality in the Basidiomycetes.)** *156 p., pl. 1-3, 30 fig.* (Dissertation.) Nemours, 1918. (2) Kniep, Hans. **Über morphologische und physiologische Geschlechtsdifferenzierung. (Untersuchungen an Basidiomyzeten.) On the morphological and physiological sex differentiation. (Studies on Basidiomycetes.)** Verhandl. Physik.-med. Ges. Würzburg. *18 p.* 1919.] Zeitschr. Bot. 12: 173-175. 1920.

711. Nilsson-Ehle, H. **Über resistenz gegen Heterodera Schachti bei gewissen gerstensorten, ihre Vererbungsweise und Bedeutung für die Praxis. [On resistance to Heterodera Schachti in certain varieties of barley, its method of inheritance and significance for agricultural practice.]** Hereditas 1: 1-34. *4 fig.* 1920.

712. Pearl, Raymond. **A contribution of genetics to the practical breeding of dairy cattle.** Proc. Nation. Acad. Sci. [U. S.] 6: 225-233. *1 fig.* April, 1920.—This paper presents a brief résumé of the conclusion drawn from the study of Jersey registry-of-merit sires relative to what these sires did in transmitting milk yield, butter-fat percentage and butter-fat to their offspring. The measure of this performance is daughter's production minus dam's production equals the genetic worth of the sire for transmitting milk yield, etc., to his offspring.—Transmitting power of 224 sires for butter-fat are presented in this paper. The reader is referred to the complete paper from the Maine Station for the other detailed results.—Certain of the conclusions are: (1) There are 224 Jersey registry-of-merit sires which meet the requirements of this performance test for their transmitting qualities in milk production. One hundred and five of these sires, or less than one-half, raise the milk production of their daughters over that of the dams of these daughters. The largest number of daughter-dam pairs is 39 for the sire Hood Farm Pogis 9th, 55552. Of those sires which have a large number of pairs, Hood Farm Torono 60326 with 34 pairs stands first in his transmitting qualities raising the milk production of his daughters on the average 2620.1 pounds.—(2) Two hundred and twenty-five sires are included in the table giving the sires which met the requirements of the daughter-dam performance test for transmitting qualities of butter-fat percentage. Out of this number 101 sires raised the butter-fat percentage of their daughters' milk as compared with the butter-fat percentage of the dams of these daughters. The leading sire in this butter-fat percentage performance test was Clear Brook Chief 74685 raising his daughters on the average 1.338 per cent of butter fat. This sire had two daughter-dam pairs. Hood Farm Pogis 9th leads in number of daughter-dam pairs with 42. This bull raised the butter-fat percentage of his daughters on the average of 0.243 per cent over the butter-fat percentage of the dams of their daughters.—(3) The sires mentioned as superior in the milk-transmitting ability, Hood Farm Torono and Spermfield Owl, do not check up so well in their ability to transmit high butter-fat percentage. Hood Farm Torono caused his daughters on the average to be 0.225 per cent

of butter-fat below what the dams of these daughters produced. Spermfield Owl only raised his daughters on the average 0.027 per cent of butter fat over what the dams of these daughters produced.—(4) There are 224 sires of known transmitting ability for net butter fat. Of this number only 99 sires raise the butter-fat production of their daughters over that of their dams. The sires which raised the production of their daughters' butter fat most were Sans Aloi 81012, Signal's Successor 72758, and Golden Glow's Chief 61460. The sires which made the deepest impress on the breed by raising the butter fat of the largest number of daughters over that of their dams was Hood Farm Torono with 34 pairs and an average increase for each daughter of 121.51 pounds of butter fat. The next bull, Spermfield Owl, with 26 pairs raised the butter-fat production 97.71 pounds on the average for each of his daughters. Some of the bulls lowering the production of their daughters markedly were Gertie's Son of Washington 83799, Hood Farm S. Tormentor 96311, and Oxford Lad's Owl 75599.—(5) The information summarized above was arranged to reveal the transmitting qualities for milk production, butter-fat percentage and butter fat of Jersey sires to their sons. There were 159 sires which had sons whose progeny performance was known. Of this number 69 or significantly less than half had sons who raised the butter-fat production of their daughters over that of their dams. —(6) The sires of superior merit are defined as those which raise the milk production and butter-fat percentage of their daughters as compared with that of their dams. The inferior sires are defined as those sires who lower the milk production and butter-fat percentage of their daughters as compared with the same variables in their dams. The superior sires so defined were arranged by the amount of butter fat that they increase the production of their daughters over that of their dams. The inferior sires were classified according to the amount of butter fat that they decrease the production of their daughters in comparison with that of their dams. These two groups of sires are subjected to four generations of pedigree analysis to determine their inbreeding and relationship, the amount of Island and American stock, "males and females" and "on the sire's side of the pedigree and on the dam's side of the pedigree," and the individual animals most frequently repeated into two groups of pedigrees.—(7) There are 28 sires in the group of sires superior in their transmitting qualities for milk production and butter-fat percentage. In the group of sires inferior in their transmitting ability for these two characters there are 47 sires, a ratio of 1 to 1.7 Such a difference speaks for itself. It emphasizes with startling clearness the need of exact knowledge of the transmitting qualities of bulls to be bred as sires and of the necessity for exact knowledge of the inheritance of milk production and butter-fat percentage.—(8) The inbreeding coefficients show that the sires of superior merit have 7.08 per cent of the greatest possible inbreeding up to the fifth generation. The inferior sires are inbred 9.65 per cent of the greatest possible amount (continued brother and sister mating). The group of sires poorer in their transmitting qualities are consequently more inbred than the group of sires with superior transmitting qualities.—(9) The analysis of the pedigrees for the amount of relationship that may exist between the sire and dam of the individual bulls in the superior group and in the inferior group shows that there is little or no difference in the amount of this relationship within the two groups.—(10) The resolution of the four generation pedigrees into the Island-bred Jerseys and by difference into the American-bred Jerseys showed the mean number of Island males in the pedigrees of the superior sires' group to be 8.07 and the mean number of females 7.79. The mean number of Island-bred males in the inferior sires' group were shown to be 6.94. and the mean number of females 6.55. The group of sires which increased the production of their daughters over that of their dams had, consequently, more Island-bred stock in their pedigrees. The females in each group of the pedigrees had a smaller proportion of Island-bred individuals than the males had in each of the groups.—(11) Study of the pedigrees of these two groups of sires discloses the fact that all the animals which appeared in the pedigrees of the superior sire on the male side of the pedigrees more than four times or on the female side of the pedigree more than three times also had appearances in the pedigrees of the sires inferior in their transmitting qualities. This fact alone makes it clear that the appearance of certain famous animals in the pedigree of a given bull is no guarantee of that particular bull's worth.—*John W. Gowen.*

713. Pomeroy, C. S. **"Sports" or bud-variation in the rose.** Amer. Rose Ann. 1919: 36–37. Mar. 15, 1919.—Rose has greater number of recognized bud varieties than any other plant. Carrière (1865) noted 50 standard roses of "bud-sport" origin, and his list was incomplete. 1918 Rose Annual mentioned 90 "bud-sport" varieties, none of which were included in Carrière's list. Killarney, Radiance and Ophelia are in a mutating stage of development —more or less unstable—and give rise to numbers of bud varieties. No artificial method of inducing "bud sports" is known. "Bud sports" are generally comparatively stable. United States Department of Agriculture, through the writer, desires to secure a complete list of all varieties of plants which have originated as "bud sports." Information should include name of parent variety, description of new form, place found, and name of finder. If desired, such information would remain confidential.—*Orland E. White.*

714. Punnett, R. C. **Mendelism.** *5th ed., 13 × 19 cm., v + 219 p., 7 pl., 52 fig.* Macmillan & Co.: London, 1919.—This edition differs from the fourth in that several chapters have been re-written, and two chapters (X and XII) have been added to present the results of the *Drosophila* work, and the chromosome theory which has grown out of that work. Author does not agree with Morgan that "as the result of these researches, the problem of heredity has been solved," but he does concede that the work with *Drosophila* constitutes "the most noteworthy contribution to genetical studies" since the appearance of the last edition in 1912.—*G. H. Shull.*

715. Rasmuson, J. **Mendelnde Chlorophyll-Faktoren bei Allium cepa. [Mendelian chlorophyll factors in Allium Cepa.]** Hereditas 1: 128–134. 1920.

716. Rasmuson, Hans. **Über einige genetische Versuche mit Papaver Rhoeas und Papaver laevigatum. [Some genetical experiments with Papaver rhoeas and Papaver laevigatum.]** Hereditas 1: 107–114. 1920.

717. Rosendahl, H. V. **Tre för norra Europa nya Asplenier. [Three new Aspleniums for northern Europe.]** Bot. Notiser 1918: 161–168. 1918.—At Taberg in Småland (Sweden) *Asplenium adulterinum* was found, there, as in other places in Europe, growing on serpentine ground. Also the hybrid *Asplenium adulterinum* × *viride* was there to be seen. Its spores are entirely undeveloped.—*K. V. Ossian Dahlgren.*

718. Russell, S. F. **Inheritance of characters in sheep.** Oklahoma Agric. Exp. Sta. Bull. 126. *22 p., 8 fig.* 1919.—From crosses of Shropshire-Dorset, Shropshire-Rambouillet, Dorset-Rambouillet, Dorset-Merino, Shropshire-Merino, and back crosses, author concludes that absence of folded skin, dark markings of the Shropshire, early breeding of Dorsets, and, in females, hornless character of Shropshires, are dominant. A dominance of mutton conformation was maintained and Merinos and Rambouillets transmitted their density of fleece. Data on time of lambing and relative prolificacy are given.—*Elmer Roberts.*

719. Shamel, A. D. **Origin of a grapefruit variety having pink-colored fruits.** Jour. Heredity 11: 157–160. *4 fig.* April, 1920.

720. Shull, Charles A. **Variation in Abutilon Theophrasti Medici.** Science 52: 41. July 9, 1920.—Author's abstract of paper read before Seventh Annual Meeting, Kentucky Academy of Science, Lexington, May 8, 1920:—This paper is a report of progress in an investigation of variability in the number of carpels in the ovaries of *A. Theophrasti.* The range of variability is from ten to seventeen, with the mode usually on 14 or 15. The material shows a skewed frequency distribution, and tendency toward half-Galton curves. A number of plants have been found with half curves and the mode on 15. But whenever a number of plants are counted together, there are usually a small number falling on 16. Only 3 specimens in about 8000 had 17 carpels to the ovary. The mode falls on a lower number in material collected in Kansas than in similar material from Kentucky. The drier climate of Kansas is probably responsible for this difference. If plants from an unfavorable habitat are counted the mode

is found to be depressed. The modifications of the variability curves noted are probably related rather directly to nutritional conditions. Heredity and suboptimal nutrition are believed to be responsible for the half-curve variability.—*Charles A. Shull.*

721. Shull, J. Marion. **Concerning Iris colouration.** Gard. Chron., 67: 291. June 12, 1920.—Author presents observations on *neglecta* forms of *Iris*, which are colored forms lacking yellow plastids, and points out that it is to be expected that such will show a clear purple or violet rather than a brownish coloration, since latter is composite effect of anthocyanin and yellow plastids. Further observes that yellow occurs in both "standards" and "falls" while anthocyanin may not be so distributed. Non-hereditary freak bearing on brownish and purple coloration is also described.—*James P. Kelly.*

722. Sirks, M. J. **Erfelijkheids- en selectieonderzoekingen bij Vicia-soorten. I. De Navelkleur van Vicia faba. [Inheritance and selection experiments in Vicia species. I. The eye-color of Vicia faba.]** Genetica 2: 193-199. May, 1920.

723. Sirks, M. J. [Dutch rev. of: Castle, W. E. **Studies of heredity in rabbits, rats and mice.** Carnegie Inst. Washington Publ. 288. *56 p., 3 pl.* 1919.] Genetica 2: 248-251. May, 1920.

724. Sirks, M. J. [Dutch rev. of: Dahlgren, K. V. Ossian. **Erblichkeitsversuche mit einer dekandrischen Capsella bursa-pastoris (L.). (Gentical investigations with a decandrous Capsella bursa-pastoris (L.).)** Svensk Bot. Tidsskr. 13: 48-60. *2 fig.* 1919. (See Bot. Absts. 3, Entry 616.)] Genetica 2: 254. May, 1920.

725. Sirks, M. J. [Dutch rev. of: Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel. Erdbirne, Lein, Hanf, Tabak, Hopfen, Buchweizen, Hülsenfruchtern und kleeartigen Futterpflanzen. (Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops. buckwheat, legumes and clover-like forage plants.)** *3rd ed., 240 p., 45 fig.* P. Parey: Berlin, 1919.] Genetica 2: 257. May, 1920.

726. Sirks, M. J. [Dutch rev. of: Fruwirth, C., Th. Roemer, E. von Tschermak. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe. (Handbook of agricultural plant breeding. 4. Breeding of the four chief cereals and sugar beets.]** *3rd ed., 8vo., xv + 504 p., 42 fig.* Paul Parey: Berlin, 1918.] Genetica 2: 256. May, 1920.

727. Sirks, M. J. [Dutch rev. of: Schaxel, J. **Grundzüge der Theorienbildung in der Biologie. (Principles of theory formation in biology.)** *221 p.* G. Fischer: Jena, 1919.] Genetica 2: 267-268. May, 1920.

728. Sirks, M. J. [Dutch rev. of: Schaxel, Julius. **Über die Darstellung allgemeiner Biologie. (On the presentation of general biology.)** Abhandl. Theoret. Biol. *62 p.* 1919.] Genetica 2: 268-269. May, 1920.

729. Sirks, M. J. [Dutch rev. of: Tischler, G. **Ueber die Sogenannten "Erbsubstanzen" und ihre Lokalisation in der Pflanzenzelle. (On the so-called hereditary substances and their localization in the plant cell.]** Biol. Zentralbl. 40: 15-28. 1920.] Genetica 2: 271-273. May, 1920.

730. Sirks, M. J. [Dutch rev. of: (1) Tower, W. L. **The mechanism of evolution in Leptinotarsa.** Carnegie Inst. Washington Publ. 263. *viii + 284 p., 19 pl., 161 fig.* 1918. (See Bot. Absts. 4, Entry 794.) (2) Breitenbecher, J. K. **The relation of water to the behavior of the potato beetle in a desert.** *Ibid.* 263. *340 p., 19 pl.* 1918.] Genetica 2: 274-277. May, 1920.

731. Sirks, M. J. [Dutch rev. of: van Wisselingh, C. **Über Variabilität und Erblichkeit. (Variation and heredity.)** Zeitschr. indukt. Abstamm. Vererb. 22: 65–126. *10 fig.* Jan., 1920.] Genetica 2: 285–287. May, 1920.

732. Sirks, M. J. [Dutch rev. of: Ziegler, H. E. **Zuchtwahlversuche an Ratten. (Selection experiments on rats.)** Festschr. 100-jähr. Best. Kgl. Württ. Landw. Hochschule Hohenheim. *p. 385–399.* 1919.] Genetica 2: 287–288. May, 1920.

733. Smith, H. **Vegetationen och dess utvecklingshistoria i det central-svenska högfjällsomradet. [The vegetation of the central Swedish high-mountain region and the history of its development.]** (Inaugural dissertation.) Norrländskt handbibliotek IX. *185 × 270 mm., 238 p., 41 fig., 2 maps.* Upsala, 1920.—In the list of the vascular plants of this region (Härjedalen and parts of Jämtland) the finding of a great number of hybrids is mentioned, namely: *Woodsia alpina* × *ilvensis*, *Equisetum trachyodon* (= *E. hiemale* × *variegatum*), *Calamagrostis neglecta* × *purpurea*, *Carex brunnescens* × *Lachenalii*, *C. canescens* × *loliacea*, *C. Goodenoughii* × *rufina*, *C. Goodenoughii juncea* × *rufina*, *C. aquatilis* × *Goodenoughii*, *C. livida* × *vaginata*, *C. atrata* × *Halleri*, *C. flava* × *Hornschuchiana*, *C. rotundata* × *saxatilis*, *Juncus arcticus* × *filiformis*, *Luzula confusa* × *spicata*, *L. arcuata* × *spicata*, *L. sudetica* × *spicata*, *Orchis cruenta* × *maculata*, *Salix caprea* × *lapponum*, *S. nigricans* × *phylicifolia*, *S. arbuscula* × *herbacea*, *S. arbuscula* × *lapponum*, *S. arbuscula* × *reticulata*, *S. hastata* × *herbacea*, *S. hastata* × *lanata*, *S. hastata* × *reticulata*, *S. glauca* × *myrsinites*, *S. glauca* × *nigricans*, *S. glauca* × *phylicifolia*, *S. myrsinites* × *nigricans*, *S. herbacea* × *lanata*, *S. herbacea* × *lapponum*, *S. herbacea* × *reticulata*, *S. herbacea* × *polaris*, *Betula nana* × *pubescens*, *Stellaria calycantha* × *longifolia*, *Cerastium alpinum* × *vulgare*, *Sagina intermedia* × *Linnaei*, *S. Linnaei* × *procumbens*, *Melandrium album* × *silvestre*, *Draba incana* × *rupestris*, *Viola epipsila* × *palustris*, *Epilobium anagallidifolium* × *lactiflorum*, *E. alsinifolium* × *palustre*, *E. Hornemanni* × *lactiflorum*, *Euphrasia minima* × *tenuis*, *Erigeron borealis* × *politus*.—Interesting is a newly described species *Poa herjedalica*. C. A. M. Lindman has previously called this *Poa alpina* × *pratensis*. Most certainly it is produced by such a combination. Any viviparous forms have however never been found in this territory. Whether *Poa herjedalica* is a vegetatively propagated hybrid or a descendant of a hybrid it does not produce any noteworthy capacity for variations or any resemblance to either of the presumed parents.—*K. V. Ossian Dahlgren.*

734. Sô, Masao, and Yoshitaka Imai. **The types of spotting in mice and their genetic behaviour.** Jour. Genetics 9: 319–333. *1 pl.* Mar., 1920.—Authors find two independent forms of spotting in mice: (1) Ordinary piebald, *s*, recessive to self, *S*; (2) Factor *D* producing dominant spotting when acting upon self-coated "Kasuri" race. Some factor acting upon piebald spotting produces dark-eyed white "Daruma" type. All mice homozygous for *D* perish probably during early ontogeny. "Kasuri" race often becomes sterile, especially upon female side, "Daruma" less frequently so. General results confirm previous work of reviewer and of Detlefsen.—*C. C. Little.*

735. Tedin, Hans. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 colored pl., 2 fig.* 1920.

736. Thomson, J. Arthur. [French rev. of: Dendy, A. **Animal life and human progress.** *8vo, ix + 227 p.* Constable & Co.: London, 1919.] Scientia 27: 322–324. 1920.

737. Thomson, J. Arthur. [French rev. of: Hensen, V. **Tod, Zeugung und Vererbung, unter besonderer Berücksichtigung der Meeresbewohner. (Death, reproduction and heredity with special reference to marine animals.)** *84 p., 20 fig.* Lipsius & Tischer: Kiel & Leipzig, 1913.] Scientia 14: 487. 1920.

738. Tischler, G. **Ueber die sogenannten "Erbsubstanzen" und ihre Lokalisation in der pflanzenzelle. [On the so-called hereditary substance and its localization in the plant cell.]** Biol. Zentralbl. 40: 15–28. 1920.—See Bot. Absts. 6, Entry 729.

739. Tischler, G. [German rev. of: de Vries, Eva. **Versuche über Frucht- und Samenbildung bei Artkreuzungen in der Gattung Primula. (Studies on fruit and seed formation in species crosses in the genus Primula.)** Recueil Trav. Bot. Néerlandais 16: 63–205. 1919.] Zeitschr. Bot. 12: 169–171. 1920.

740. Tjebbes. [Dutch rev. of: von Hofsten, N. **Ärftlighetslära. (Genetics.)** *17 × 26 cm., viii + 506 p., 191 fig., 1 colored pl.* P. A. Norstedt & Söners förlag: Stockholm, 1919. (See Bot. Absts. 3, Entry 2208.)] Genetica 2: 263–264. May, 1920.

741. Tjebbes. [Dutch rev. of: Winge, Ø. **Om Nedarvningen af Hestend Lød. (Inheritance of coat color in cattle.)** Nordisk Jordbrugsforskning 1920: 1–30. 1920.] Genetica 2: 284–285. May, 1920.

742. Torsell, R. **Iakttagelser rörande den s. k. slidsjukans uppträdande a höstvete vid Ultuna sommaren 1918. [Observation of the disease caused by Cicadula sexnotata, appearing on wheat at Ultuna in the summer of 1918.]** Sveriges Utsädesf. Tidskr. 28: 260–274. 1918.—Between different kinds of winter wheat there are differences in their resistance against the disease,—for each kind a particular resistance, apparently transmissible to the descendants. The power of resistance, seems to be directly influenced by different qualities, specially concerning the winter-hardiness. The most effective way to avoid the disease in question is to grow resistant and highly hardened sorts of wheat. [See also Bot. Absts. 6, Entry 746.]—*K. V. Ossian Dahlgren.*

743. van der Wolk, P. C. **Eine neue Phase der experimentellen Entwicklungslehre. [A new phase of experimental evolution.]** Umschau. 1920: 63–66. 1920.

744. van Herwerden, M. A. [Dutch rev. of: (1) Calkins, G. N., and L. H. Gregory. **Variations in the progeny of a single ex-conjugant of Paramaecium caudatum.** Jour. Exp. Zool. 15: 467. 1913. (2) Stocking, R. J. **Variation and inheritance in abnormalities occurring after conjugation in Paramaecium caudatum.** *Ibid.* 19: 387. 1915. (3) Middleton, A. R. **Heritable variations and the results of selection in the fission rate of Stylonychia pustulata.** *Ibid.* 19: 451. 1915. (4) Hegner, R. W. **Variation and heredity during the vegetative reproduction of Arcella dentata.** Proc. Nation. Acad. Sci. [U. S.] 4: 283–288. Sept., 1918. (See Bot. Absts. 2, Entry 676.) (5) Ackert, J. E. **Effect of selection of Paramaecium.** Genetics 1: 407. 1916. (6) Jennings, H. S. **Heredity, variation and the results of selection in Difflugia corona.** *Ibid.* 1: 407–534. 1916. (7) Erdmann, R. **Endomixis and size variations in pure lines of Paramaecium aurelia.** Proc. Soc. Exp. Biol. Med. 16: 60–65. 1919. (See Bot. Absts. 3, Entry 2123.)] Genetica 2: 244–248. May, 1920.

745. van Herwerden, M. A. [Dutch rev. of: Goldschmidt, R. **Intersexualität und Geschlechtsbestimmung. (Intersexuality and sex determination.)** Biol. Zentralbl. 39: 498–512. Nov., 1919.] Genetica 2: 257. May, 1920.

746. Wahlstedt, I. **Iakttagelser rörande slidsjukans uppträdande å höstvete i Östergöttland sommaren 1918. [Observations concerning the disease caused by Cicadula sexnotata on winter wheat in Östergötland.]** Sveriges Utäsdesf. Tidskr. 28: 195–215. *1 fig.* 1918.—Different varieties of fall wheat show different resisting power against attacks of *Cicadula sexnotata.* [See also Bot. Absts. 6, Entry 742.]—*K. V. Ossian Dahlgren.*

747. Welch, Paul S. [Rev. of: Patterson, J. T. **Polyembryony and sex.** Jour. Heredity 10: 344–352. *2 fig.* Nov., 1919.] Trans. Amer. Microsc. Soc. 39: 164–165. April, 1920.

748. Winge, Ø. **Om Nedarvningen af Hestend Lød. [Color inheritance in cattle.]** Nordbrungsforskning 1920: 1–30. 1920.—See Bot. Absts. 6, Entry 741.

749. Winkler, H. **Verbreitung und Ursache der Parthenogenesis in Pflanzen- und Tierreiche. [Distribution and cause of parthenogenesis in the plant and animal kingdoms.]** *8vo, vi + 231 p.* Gustav Fischer: Jena, 1920.

750. YAMPOLSKY, CECIL. **Further observations on sex in Mercurialis annua.** Amer. Nat. 54: 280–284. *1 fig.* May–June, 1920.—Author grew four plants of *Mercurialis annua* from seeds collected from a monoecious individual. In general habit of growth these four plants were like typical female plants. During the earlier part of the flowering season only female flowers were produced in each of the plants; later on male flowers and hermaphroditic flowers appeared along with the female flowers, the latter usually being more numerous than either of the others. Author suggests that sex is not a fixed condition in these forms of *Mercurialis annua* and that a plant may change its sex during the progress of its life cycle.—*Chester A. Darling.*

751. ZELENY, CHARLES. **Germinal changes in the bar-eyed race of Drosophila during the course of selection for facet number.** Proc. Indiana Acad. Sci. 1917: 73–77. 1918.—Writer selected for low facet- and high facet-number in the bar-eyed race of *Drosophila*. Selection was effective in both lines. Analysis of the results brings out the following facts: (1) The presence of germinal differences,—accessory unit factors,—at the beginning of selection. (2) The appearance of accessory genes during the progress of selection. (3) A change in the bar gene itself causing a return to full eye both somatically and germinally.—Another point of interest is the return of bar eye to full eye by a second route, namely, the appearance of a modifying factor in one of the autosomes.—*F. Payne.*

## MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

752. ANONYMOUS. **Anatomical modification of roots by mechanical action.** [Rev. of: BLOCH, E. **Concerning the modifications produced in the structure of roots and stalks by external compression.** (French.) Compt. Rend. Acad. Sci. Paris 158: 1701. 1914.] Sci. Amer. Monthly 1: 262. 1920.

753. BAILEY, IRVING W. **The formation of the cell plate in the cambium of the higher plants.** Proc. Nation. Acad. Sci. [U. S. A.] 6: 197–200. *8 fig.* Apr., 1920.—"A remarkable type of cytokinesis," previously reported by author for the cambium of the Coniferae, is now shown to occur in cambial initials of various representatitve angiosperms. Author states same phenomenon is found in other somatic cells "whose planes of division have one long and one short dimension." Comparative study indicates ordinary process of cell plate formation is simply extended in space and time where cell dimensions require it, to the limiting case where two widely separated "kinoplasmasomes" are formed at the free ends of the advancing cell plate.—*Howard B. Frost.*

754. BARRATT, KATE. **A contribution to our knowledge of the anatomy of the vascular system of the genus Equisetum.** Ann. Botany 34: 201–236. *Pl. 8–9, fig. 1–7.* 1920.—A detailed description of the vascular system of *Equisetum*, particularly of the developmental stages in the sporeling, is given. The thoroughness of the work was made possible by a technique which rendered whole sporelings and pieces of the adult transparent so that the vascular system could be viewed as a whole. At the base of the young sporeling is a protostele which opens out into a siphonostele at the attachment of the vascular supply of the secondary axis and then closes again for a short distance. The basal regions of the several axes formed before a rhizome appears show compact siphonosteles. These axes arise endogenously whereas the whorled aerial axes develop from superficial cells. Contrary to views held by some workers the metaxylem of the vegetative axis all develops centrifugally; nor do any metaxylem strands cross the outer surface of the nodal wood, for they are linked together at this point by short nodal tracheids. There is no trace of secondary thickening at the nodes, the apparent increase in the number of elements attributed to secondary growth being really due to the displacement of developing tracheids. The conditions found in the cone lead the author to conclude that

the axis is not differentiated into nodes and internodes, that the gaps bear no relationship to sporangiophoric traces, that they are not leaf-gaps but are related to mechanical efficiency, and that the sporangiophores are not the morphological equivalent of leaves but are organs *sui generis*. Throughout the plant the gaps are neither foliar nor ramular and have no morphological value in questions of phylogeny.—*W. P. Thompson.*

755. BEEKMAN, H. **78 Preanger-houtsoorten, beschrijving, afbeelding en determinatietabel. [78 Preanger timber species described and illustrated, with determination table.]** Mededeel. Proefsta. Boschw. Dept. Landb. Nijverheid en Handel Nederlandsch-Indië 5: 1–186. *60 pl.* 1919.—See Bot. Absts. 6, Entry 83.

756. BERGMAN, H. F. **Internal stomata in ericaceous and other unrelated fruits.** Bull. Torrey Bot. Club 47: 213–221. *9 fig.* 1920.—Numerous cases of the occurrence of internal stomata are cited. These stomata remain mostly in an open condition and are not functional. Their presence is explained by the fact that the fruit is a modified leaf, and their "persistence must be regarded as an hereditary continuation of a stomata-producing tendency after the leaf has lost its normal form and function."—*P. A. Munz.*

757. BROWN, FOREST B. H. **The refraction of light in plant tissues.** Bull. Torrey Bot. Club 47: 243–260. *4 fig.* 1920.—In order to get the clearest definition of tissue outlines under the microscope, it is necessary to know the refractive properties of these tissues. Refraction can be measured under the microscope by the use of a gradient series of media of known refractive powers, such as castor oil, clove oil, and naphthalene $\alpha$ monobromated. Directions are given for preparing such a series of media and the tissues for study. Methods of illumination and examination under the microscope are also given. It is found that in a given tissue, refraction may vary widely with imbibition and growth. To secure clearness of anatomical details, such as pits and middle lamellae, it is desirable to have a medium with the index of refraction below that of the tissue substance.—*P. A. Munz.*

758. BROWNE, ISABEL M. P. **A third contribution to our knowledge of the anatomy of the cone and fertile stem of Equisetum.** Ann. Botany 34: 237–264. *Pl. 8–9, fig. 1–7,* 1920.—The vascular systems of the cones of *Equisetum hyemale* and *E. giganteum* are described and compared with those of species previously studied. The cones of the different species can be arranged in a series, which is not to be considered a phylogenetic one, with respect to the degree of reduction of the vascular system. This reduction tends more and more to obscure both the relation of meshes (gaps) to traces and the alternation of traces in the successive whorls. The author is of the opinion that the sporangiferous annulus is a recent development in the phylogeny of the genus, the sporangia having spread to regions which were not at first sporangiferous.—*W. P. Thompson.*

759. CHODAT, R. **Le Hugueninia tanacetifolia.** Bull. Soc. Bot. Genève 11: 60–61. 1919. —The flower and inflorescence of this species are described.—*W. H. Emig.*

760. CHODAT, R. **La floraison du Lilium Martagon [The flowering period of Lilium Martagon.]** Bull. Soc. Bot. Genève 11: 50–59. *Fig. 1–5.* 1919.—The changes that take place in the flower from anthesis to the maturity of the fruit are described.—*W. H. Emig.*

761. COCKAYNE, L. **On the seedling form of the coral-shrub (Helichrysum coralloides (Hook. f.) Berth. & Hook. f.).** New Zealand Jour. Sci. Tech. 2: 274–278. July, 1919.

762. DESHMUKH, G. B. **Polyembryony.** Gardens' Bull. Straits Settlements 2: 258. 1920. —Cases of polyembryony are recorded for *Citrus decumana* L. and *Persea gratissima* Gaertn. —*T. F. Chipp.*

763. DODGE, B. O. **The life history of Ascobolus magnificus—Origin of the ascocarp from two strains.** Mycologia 12: 115–134. *Pl. 7–8, 28 fig.* 1920.—"The ascocarp of *Ascobolus magnificus* originates from a pair of morphologically distinct primordia—a large ascogonium

the end of which functions as a trichogyne, and a club-shaped antheridium. *Papulospora magnifica* Hotson is an asexual stage of *Ascobolus magnificus* Dodge. The intrahyphal mycelium found in old cultures is simply a case of "Durchwachsungen" or "cordon interne." The strains here reported, which were obtained from germinated papulospores or ascospores, were self-sterile in the experiments conducted, but always produced papulospores. Sexual reproduction occurs in cultures containing two strains properly chosen."—*H. R. Rosen.*

764. Harvey, R. B. **Relation of catalase, oxidase, and H-concentration to the formation of overgrowths.** Amer. Jour. Bot. 7: 211–221. *2 fig.* 1920.—See Bot. Absts. 6, Entry 1353.

765. Henry, A. **The Douglas firs, a botanical and silvicultural description of the various species of Pseudotsuga.** Pharm. Jour. 104: 128. 1920.

766. Jacobson, Mrs. R. **Scutellaria alpina et sa biologie florale. [Scutellaria alpina and its floral biology.]** Bull. Soc. Bot. Genève 11: 62–63. 1919.—The author describes the visits of insects and the process of pollination.—*W. H. Emig.*

767. Jennings, O. E. **The paper mulberry and "artillery plant."** Torreya 20: 52–53. 1920.—See Bot. Absts. 6, Entry 1350.

768. Loeb, J. **Quantitative laws in regeneration. I.** Jour. Gen. Physiol. 2: 297–307. 1920.—See Bot. Absts. 6, Entry 867.

769. Oschwald, Marie. **Observations sur la biologie florale des campanules. [Observations on the floral biology of species of Campanula.]** Bull. Soc. Bot. Genève 11: 64–69. *1 fig.* 1919.—A description of the floral parts of several species of *Campanula* accompanies the details regarding their pollination.—*W. H. Emig.*

770. Przibram, Karl. **Form und Geschwindigkeit. Ein Beitrag zur allgemeinen Morphologie. [Form and rapidity of movement. A contribution to general morphology.]** Naturwissenschaften 8: 103–107. 1920.—Dependence of form on the rapidity of growth in *Polypodium vulgare* is noted. Figures show differences in form when grown at different rates.—*Orton L. Clark.*

771. Sabnis, T. A. **The physiological anatomy of the plants of the Indian Desert.** Jour. Indian Bot. 1: 65–83. 97–113, 183–205, 237–251. *Pl. 3–14.* 1919–1920.—A study of Capparidaceae to Lythraceae (Bentham and Hooker's system). The salient features of leaf and stem anatomy are described and figured from herbarium material. [See also Bot. Absts. 5, Entry 1904.]—*Winfield Dudgeon.*

772. Sawhney, Kali Das. **The vascular connections and the structure of the tendrils in some Cucurbitaceae.** Jour. Indian Bot. 1: 254–262. *7 fig.* 1920.—The author has examined the vascular anatomy of the node and the vascular connections of the nodal appendages of 12 species of cultivated Cucurbitaceae. Tendrils, buds, and floral axes are connected with the nodal plexus of the inner ring of 5 cauline bundles, while the leaves are connected with the outer rings of cauline bundles. He concludes that the vascular connections and structure of the basal part of branched tendrils show that they are homologous with ordinary shoots; that the arms of branched tendrils and the upper part of simple tendrils are homologous with leaves; and that simple tendrils have been derived from branched tendrils.—*Winfield Dudgeon.*

# MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

## FUNGI

773. Atwood, Alice C. **Errors in Lindau's "Thesaurus" and Saccardo's "Sylloge."** Mycologia 12: 169–171. 1920.

774. Bailey, M. A. **Puccinia malvacearum and the mycoplasm theory.** Ann. Botany 34: 173–200. 1920.—A brief summary of the essential aspects of the mycoplasm hypothesis is followed by a detailed outline of the results obtained by Eriksson in his investigations of the rust of hollyhock. The writer's own results in his experiments with this same organism are then contrasted with those of Eriksson. He finds himself in marked opposition to the observations and deductions of the latter worker. He finds that the tendency of the promycelium in this species to break up into "oidia" rather than to form normal sporidia is merely the result of environmental conditions, and can be noted especially when the teleutospores are completely submerged. His experiments are discussed in detail, and the results are given in tabular form. He describes the apparatus which was used to insure freedom from outside infection, and discusses critically every aspect of his experimental work.—*H. M. Fitzpatrick.*

775. Jackson, H. S. **New or noteworthy North American Ustilaginales.** Mycologia 12: 149–156. 1920.—The bunt of rye, hitherto unreported from U. S. A., was detected in a collection made by L. M. Underwood in New York, 1892. It is determined as *Tilletia Secalis* and considered distinct from *T. Tritici*. *T. Holci* is reported on species of *Notholcus* from Oregon. *Entyloma Collinsiae* is reported from Oregon on two new hosts, *Collinsia grandiflora* and *C. tenella*. From the same state *Urocystis Trillii* sp. nov. is described on *Trillium chloropetalum*. Collections on *Quamasia hyacinthina* from Indiana and *Q. quamash* from Oregon are assigned to *Urocystis Ornithogali*. *Tubercina Trientalis* is reported on a new host, *Trientalis latifolia* and from a new locality, Oregon. Because of morphological differences as well as different genera of hosts attacked *Cintractia axicola minor* Clinton is raised to specific rank, *C. minor* (Clinton) comb. nov. *Cerastium oreophilum*, *Silene Watsoni* and *Stellaria Jamesiana* are reported as new hosts for *Sorosporium Saponariae*. *Tolyposporium Iresine* is described and the new combination *Thecaphora Iresine* (Elliott) is made. *Tolyposporium Junci* is reported for the first time from North America; two Oregon collections on *Juncus bufonius* are recorded. —*H. R. Rosen.*

776. Killerman, S. **Fund von Polyporus montanus Quélet in Bayern. [Discovery of P. montanus in Bavaria.]** Hedwigia 61: 1–3. *1 pl.* 1919.—A large (60 cm. diam.) polypore was found at the base and on the large roots of the "big fir" at Waldhaus, in the Bavarian forest. A description and illustrations are presented. Critical comparison with described species leads to the conclusion that it is *P. montanus*.—*D. Reddick.*

777. Krieger, Louis C. C. **Field key to the genera of the gill mushrooms.** Chart (17 X 28 in.) with 8 pages of text. The Norman Remington Co.: Baltimore, 1920.—Chart is printed in black on white paper, and is folded into a small, pocket-size, press-board covered booklet containing eight pages of explanatory matter. It is designed for field use, but can also be used as a wall chart. The principal genera of the Agaricaceae are included, and an attempt has been made to furnish an illustrated key which will enable the novice to determine the generic position of mushrooms as they are collected in the field. Genera known to contain poisonous species are indicated.—*H. M. Fitzpatrick.*

778. Murrill, W. A. **Another new truffle.** Mycologia 12: 157–158. *1 fig.* 1920.—Material collected by Dr. C. L. Shear in Maryland and first studied by Dr. H. W. Harkness is described as *Tuber Shearii* Harkness, sp. nov.—*H. R. Rosen.*

779. Murrill, W. A. **Oudemans' work on fungi.** [Rev. of: Oudemans, C. A. J. A. **Enumeratio systematica fungorum.** Vol. I. *cxxvi + 1230 p.* Martinus Nijhoff: The Hague, 1919.] Mycologia 12: 169. 1920.—"This first volume is valuable because of its extended bibliography and numerous citations to the literature of the fungi which it contains. As a host index for the fungi, it includes all European plants [cryptogams to orchids; remainder of monocotyledons and all dicotyledons to appear in subsequent volumes], many of which occur also in the United States, and also all plants grown in conservatories in Europe, among which will be found many species from tropical America."—*H. R. Rosen.*

780. Odell, W. S. **A rare fungus new to Canada.** Canadian Field-Nat. 34: 10–13. *6 fig.* 1920.—*Morchella bispora* Sor. was first found in Canada at Chelsea, Quebec, and near Ottawa, Ontario.—*W. H. Emig.*

781. Overholts, L. O. **Some mycological notes for 1919.** Mycologia 12: 135–142. *Pl. 9–10.* 1920.—Notes based on collections made in Pennsylvania, clarifying and amplifying previous descriptions of the following fungi: *Clavaria ornatipes* Peck, *Craterellus pistillaris* Fr., *Fomes bakeri* (Murrill) Sacc., *Merulius aureus* Fr., *Mucronella ulmi* Peck, *Paxillus corrugatus* Atk., *Polyporus Schweinitzii* Fr., *Poria semitincta* Peck., *Tremella sparassoidea* Lloyd, *Tremella vesicaria* Fr., *Tremellodon gelatinosum* (Scop.) Fr., *Trichoglossum hirsutum* (Pers.) Boudier.—*H. R. Rosen.*

782. [Pennell, Francis W.] **Index to American mycological literature.** Mycologia 12: 172–174. 1920.

783. Standley, Paul C. **Rusts from Glacier National Park, Montana.** Mycologia 12: 143–148. 1920.—A list of 61 species of rusts collected by the writer and determined by Dr. J. C. Arthur.—*H. R. Rosen.*

784. Subramiam, L. S. **A Pythium disease of ginger, tobacco, and papaya.** Mem. Dept. Agric. India (Bot. Ser.) 10: 181–194. *Pl. 1–6.* 1919.—The morphology of the fungus, its systematic position, and remedial measures for the disease are described. The name *Pythium Butleri* is proposed.—*F. M. Schertz.*

785. Suematsu, N. **On the artificial culture of Helminthosporium Oryzae.** Bot. Mag. Tokyo 33: 291–297. *3 fig.* 1919.—A new method of isolating the fungus is reported. A small piece of diseased leaf is removed to a petri-dish containing rice-leaf decoction agar. After two days plenty of spores are formed, then by transferring one of the spores a pure culture is secured. Germination of the spores of the fungus generally takes place at both ends of the cell. Secondary spore formation does not occur so frequently as observed by Ravn in his *Hel. gramineum.* In drop culture conidiophores bear one to four spores, and frequently fertile tips continue growth as successive conidia are formed. Spore formation takes place in bright daylight. Cultural experiments with use of several culture media were performed, and the results are tabulated in detail.—*T. Matsumoto.*

## LICHENS

786. Havaas, Johan. **Lichen vegetationen ved Mosterhavn.** [**Lichen vegetation by Mosterhavn.**] Bergens Mus. Aarb. (Naturh. Raekke) 1917–1918: 1–53. 1918.—List, by Mosterhavn, of lichens from the vicinity of Bergen, including a number not before found in Norway. The moist climate with little snow is favorable to lichens.—*A. Gundersen.*

787. Lettan, G. **Beiträge zur Lichenographie von Thüringen.** [**Lichenography of Thuringia.**] Hedwigia 61: 97–175. 1919.—Collections made in practically all parts of Thuringia, including particularly valleys and mountains. Distribution with respect to elevation, geological formation, dominant vegetation, etc.; 549 species are described, 70 being new to Thuringia, 4 or 5 new to Germany, none new to science.—*D. Reddick.*

788. Watson, W. **Lichens of Llanberis and district.** Jour. Botany 58: 108–110. 1920.—The list given supplements that of Wheldon (Jour. Botany 58: 11–15). About ninety forms are considered.—*K. M. Wiegand.*

## BACTERIA

789. Peterson, W. H., and E. B. Fred. **The fermentation of glucose, galactose and mannose by Lactobacillus pentoaceticus n. sp.** Jour. Biol. Chem. 42: 273–287. 1920.—See Bot. Absts. 6, Entry 1338.

790. Winslow, C.-E. A., William Rothberg, and Elizabeth I. Parsons. **Notes on the classification of the white and orange Staphylococci.** Jour. Bact. 5: 145–167. 1920.—One hundred and eighty strains of *Staphylococcus* were collected from various sources, 104 of which were from pathological conditions in man and animals. Several tests were made on each strain, and the conclusions are reached that the generic names *Aurococcus* and *Albococcus* used by the Winslows should not be retained for this group but, that all should be included under the genus *Staphylococcus*. Of the forms studied, six species are recognized, based on the color of pigment formed, the power of fermenting lactose, and the power of liquefying gelatin. The species recognized are *St. aureus* Rosenbach, *St. aurantiacus* Schroter, *St. epidermidis* Gordon, *St. candidus* Cohn, *St. tetragenus* Gaffky, and *St. candicans* Flugge.—*Chester A. Darling.*

## MYXOMYCETES

791. Lister, G. **Mycetozoa from Cornwall.** Jour. Botany 58: 127–130. 1920.—A short account is given of the activities of Alfred Adams as a collector and student of Mycetozoa, especially in Cornwall. A list of 82 species and 4 varieties is given as occurring in Cornwall. This list is based on the work of Adams and on notes by. G. H. Fox and J. M. Coon.—*K. M. Wiegand.*

# PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

792. Benson, W. N. **A review of recent researches on the mesozoic floras of Australasia.** New Zealand Jour. Sci. Tech. 2: 29–32. 1919.—Views of Walkom, Arber and others are compared, especially as to correlation of Australian and New Zealand strata. Australian mesozoic flora has four times as many species as that of New Zealand.—*A. Gundersen.*

793. Berry, Edward W. **The ancestors of the Sequoias.** Nat. Hist. 20: 152–155. *Maps and plate.* 1920.—Brief account of the geological history of *Sequoia*, with maps showing Mesozoic and Cenozoic occurrences.—*E. W. Berry.*

794. Cockerell, T. D. A. [Rev. of: Knowlton, F. H. **A catalogue of the Mesozoic and cenozoic plants of North America.** U. S. Geol. Surv. Bull. 696. *815 p.* 1919.] Torreya 20: 53–57. 1920.—Enumerates 4789 accepted forms, including the fossil plants of Alaska, but excluding those of Greenland and Mexico. The species are listed by strata and localities. Nearly all the genera of woody plants well represented today in North America appear also in the Tertiary flora. The herbaceous plants are very scantily represented.—*J. C. Nelson.*

795. Conklin, E. J. **The rate of evolution.** Sci. Monthly 10: 589–602. 1920.—The results of evolution are diversity, adaptation and progress. Diversity appears as varieties, species and genera, but they are usually better adapted than their ancestors. The first is the most evident phase and the one dealt with in experimental evolution.—Differences may be classified as (1) fluctuations, (2) new combinations, (3) mutations. Fluctuations are due to environment and are the modification of the soma rather than of the germplasm, of the individual development rather than heredity. They are of little evolutionary value. New combinations of Mendelian factors in sex reproduction give the most common inherited diversity.

This is Burbank's method of producing his "new creations in plant life." It is usually possible after a few generations to get homozygotes that breed true and in this way a new variety is established. These may be of evolutionary value.—Genuine mutants have now been found in so large a number of plants and animals that it seems probable that all inherited differences appeared in the first instance in this way.—The rate at which mutations appear seems to differ greatly in different species. But they are probably of more frequent occurrence than is now known. Drosophila has furnished the largest number of mutants now known. Many of these contain lethal factors causing the early death of the individual.—Whether mutations are caused by environmental conditions is at present unknown, although Muller and Altenburg found them more frequent at high temperatures.—Species are presumably the result of the heaping up of viable mutations. The approximate number of known living and extinct species in the different phyla of the animal kingdom differs very greatly, e.g., Protozoa 8000, Rotifera 500, Arthropoda 400,000, Pisces 13,000, Amphibia 1,400, Reptilia 3,500, Aves 13,000, Mammalia 3,500. It is apparent that the number of species in a group is not dependent entirely upon its age. Birds, which arose in Jurassic, have three times as many species as Mammals, which appeared in Triassic.—The number of species is not dependent on the number of individuals produced, nor upon their rate of reproduction. Birds, which are relatively few in number of individuals and of eggs produced, have as many species as the much older class of fishes, which lay perhaps a thousand times as many eggs. In general it seems that evolution has been more rapid where fewer, better cared for young are produced.—Size does not seem to be directly related to the rate of evolution, nor does it seem to be dependent always upon changes in environment and diversities of habitat. Many paleontologists mention that the rate and direction of evolution are determined by environmental changes and speak of "waves of evolution." The number of mutations that survive and give rise to species is limited by environment, that is by natural selection. Rate of mutation seems to depend upon the particular organization of the germplasm, some types being relatively stable with few mutations, other types relatively unstable with numerous mutations.—The fact of survival is evidence of adaptation, and the rate of adaptation does not seem to be proportional to the rate of reproduction, but rather to have gone farther in organisms in which the rate of reproduction and of elimination is relatively slow.—Thousands of species appear which do not lead to any increase in complexity. There are probably more than a million species and yet there have been relatively few lines of progress. Every mutant does not represent the beginnings of a new path of evolution. Increasing complexity must have depended upon rare and fortunate mutations which contained the possibilities of further evolution. Certain species are too highly specialized to give origin to new lines of progress.—The utmost limits of progressive organization within the limits of a single cell were probably reached before Proterozoic time. Since that time the paths of progress are in multicellularity, multiplicity of tissues, organs and parts, compound organisms, social evolution and rational evolution of human society.—In conclusion, the suggestion is made that recent theories as to causes of evolution are not wholly satisfactory. There may be important factors in evolution not yet "dreamed of in our philosophy."—*L. Pace.*

796. Davies, D. **Distribution of the different species of flora and fauna from the Westphalian and part of the Staffordian series of Clydach Vale and Gilfach Goch, east Glamorganshire.** Trans. Inst. Mining Eng. 59: 183–221. July, 1920.—A compilation of 25 years' collecting from the Carboniferous of Wales, the fossil plants having been determined by R. Kidston. These number 4000 specimens and their chief value lies in the careful stratigraphic location of each, thus affording data for determining the range of the different species and their value in correlation.—The forms enumerated comprise 12 species of *Calamites*, 1 of *Equisetites*, 6 of *Asterophyllites*, 5 of *Annularia*, 9 of fructifications and miscellaneous calamite remains, 5 of *Sphenophyllum*, 8 of *Lepidodendron*, 1 of *Bothrodendron*, 1 of *Ulodendron*, 2 of *Lepidoploios*, 4 of *Lepidophyllum*, 1 of *Asolanus*, 1 of *Halonia*, 4 of *Lepidostrobus*, 18 of *Sigillaria*, 2 of *Stigmaria*, 14 of *Neuropteris*, 1 of *Zeilleria*, 21 of *Sphenopteris*, 1 of *Dolerophyllum*, 1 of *Alliopteris*, 5 of *Pecopteris*, 4 of *Mariopteris*, 2 of *Linopteris*, 1 of *Dactylotheca*, 2 of *Crossotheca*, 1 of *Corynopteris*, 5 of *Alethopteris*, 1 of *Eremopteris*, and a variety of seeds and miscellaneous remains.—*E. W. Berry.*

797. Dixon, H. N. **Description of the mosses.** Quart. Jour. Geol. Soc. London 75: 200. 1920.—Identifies five common English lowland species of mosses from the Pleistocene of the Durham coast.—*E. W. Berry.*

798. Oyen, P. A. **Kalktuf i Norge.** **[Calcareous tufa in Norway.]** Norsk Geologisk Tidsskr. 5: 231–350. *27 fig.* 1919.—Describes Pleistocene and post Glacial plants from the Calcareous tufa in Norway.—*E. W. Berry.*

799. P., E. [Rev. of: Anonymous. **Report of the Advisory Committee on Brown Coal, State of Victoria.** *32 p.* Mines Dept., Victoria: Melbourne, Sept., 1917.] New Zealand Jour. Sci. Tech. 1: 127. March, 1918.

800. Rands, H., and W. O. R. Gilling. **New Zealand brown coals.** Dominion of New Zealand, B. Sci. and Art, Bull. 1. *42 p.* Wellington, 1918.

801. Reid, C., and J. E. Marr. **Pleistocene deposits around Cambridge.** Quart. Jour. Geol. Soc. London 75: 226–227. 1920.—Lists the following representatives of an Arctic flora found in the Pleistocene at Barnwell Station, which is correlated with the late glacial deposits of the Lea Valley that contain strikingly similar Arctic flora: *Thalictrum albinum* L., *Ranunculus hederaceus* L., *lingua* L.?, *repens* L.?, *bulbosus* L., *amplexicaulis* L.?, *Draba incana* L., *Viola palustris* L., *Silene coelata* Reid, *Linum praecursor* Reid, *Rubus* sp., *Potentilla erecta* Hampe, *Anserina* L., *Hippurus vulgaris* L., *Myriophyllum spicatum* L., *Armeria arctica* Wallr., *Menyanthes trifoliata* L., *Betula nana* L., *Carpinus betulus* L., *Salix lapponum* L., *cinerea* L., *repens* L., *herbacea* L., *reticulata* D., *Sparganium minimum* Fr., *Potamogeton heterophyllus* Schreber, *densus* L., *obtusifolius* M. and K., *Eleocharis palustris* R. and S., *Scirpus* sp., *Carex incurva* Lightf., *vulpina* L., *Isoëtes lacustris* L.—*E. W. Berry.*

802. Reid, E. M. **Preliminary description of the plant remains.** Quart. Jour. Geol. Soc. London 75: 197–200. 1920.—Gives results of preliminary study of what the authoress calls the Castle Eden flora, found fossil on the Durham coast in fissures in the Permian Magnesian limestone. Fifty or more species chiefly rock and bank dwelling plants are recognized of which more than half are exotics showing resemblances to modern Asiatic forms; e.g., *Rubus flosculosus,* now Chinese, is represented. This flora is considered as older than the celebrated Cromer plant bed and not younger (possibly slightly older) than the Teglian flora of the Dutch-Prussian border.—The author calls the age Pliocene. It might be more properly considered as early Pleistocene.—*E. W. Berry.*

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

803. Anonymous. **Kauri-gum oil.** Chem. & Druggist 92: 9. 1920.—Crude kauri-gum distilled under commercial conditions in New Zealand yields an oil which is separated into motor spirit, 15 per cent, a solvent oil, 15 per cent, paint oil, 30 per cent, varnish oil, 30 per cent, and pitch the remainder.—*E. N. Gathercoal.*

804. Anonymous. **The economic resources of Burma-camphor.** Chem. & Druggist 92: 425. 1920.—*Blumea grandis,* DeCandolle (*Conyza grandis,* Wallach), a weed, 6 to 8 feet high, growing very abundantly on cut-over forest lands in Tavoy, Burma, yields a camphor reported to be identical with Chinese camphor. Steps are being taken by the Burma Forest Department to determine the commercial possibility of camphor from this source.—*E. N. Gathercoal.*

805. Anonymous. **Oil of pimento-leaves.** (Through Rept. Imp. Inst.) Chem. & Druggist 92: 390. 1920.—Leaves of *Pimenta acris* yield by steam distillation 2.9 per cent of a pale yellowish-brown volatile oil, of pleasant, aromatic odor, with a high percentage of phenols, almost entirely eugenol. Manufacturers to whom samples of the oil were submitted consider it equivalent to the oil from pimento fruit.—*E. N. Gathercoal.*

806. Anonymous. **Wild ginger.** (Through Agric. News, Imp. Dept. Agric. West Indies.) Chem. & Druggist 92: 177–178. 1920.—It has been assumed that the true ginger plant (*Zingiber officinale*) is not known in the wild state, though it doubtless is a native of tropical Asia, but extensive areas of wild true ginger plant were recently found in the Republic of Colombia along the Magdalena river in Goajira peninsula. These probably escaped from cultivation in Brazil when the Portuguese introduced ginger in the sixteenth century. Commercially, this wild ginger may prove a valuable source of the drug, though the rhizomes are small; also, this region may prove desirable for the cultivation of ginger.—*E. N. Gathercoal.*

807. Anonymous. **Poison ivy, oak and sumac.** Amer. Forestry 26: 306–307. *2 fig.* 1920.

808. Aston, B. C. **Preliminary notes on the tinctorial properties of the genus Coprosma (Family Rubiaceae).** New Zealand Jour. Sci. Tech. 1: 3. 1918.—The three widely distributed New Zealand shrubs *Coprosma grandifolia*, *C. linarifolia* and *C. areolata*, have considerable tinctorial power: orange-yellow, bright yellow, and deep brown respectively. With alkaloids an intense purple was obtained. [See next following Entry, 809.]—*A. Gundersen.*

809. Aston, B. C. **The genus Coprosma as a source of dyes.** New Zealand Jour. Sci. Tech. 1: 264–267, 346–351. *1 pl. (with specimens of dyed wool), 1 table of colors.* 1918.—Color reactions of about twenty species of *Coprosma*, with summary of vegetable coloring matters. The coprosmas, with wide distribution and quick growth on waste lands, yield varied and lasting colors and are worthy of the fullest investigation. [See next preceding Entry, 808.]—*A. Gundersen.*

810. Beath, O. A. **Poisonous plants.** Proc. Soc. Promotion Agric. Sci. 39: 39–47. 1919. —See Bot. Absts. 6, Entry 475.

811. Browne, Frank. **Some constituents of opium smoke.** Pharm. Jour. 104: 274. 1920.—An analysis of the smoke of *dross* opium extract, which is largely smoked in the East, indicates that morphine (0.016 g. per 100 g. of extract) is less abundant than in the smoke of *chandoo* opium (0.100 g. in 100 g. of the opium). As dross opium extract is admitted by smokers to be stronger in effect than chandoo, this strength must be attributed to the pyridine bases, ammonia, hydrocyanic acid and such-like substances, rather than to the morphine.—An interesting comparison is made with the constituents of tobacco smoke as follows:

| FROM 100 G. OF | CARBON MONOXIDE | MORPHINE | NICOTINE | AMMONIA | PYRIDINE | HYDROCYANIC ACID |
|---|---|---|---|---|---|---|
| | *cc.* | *g.* | *g.* | *g.* | *g.* | *g.* |
| Dross opium extract....... | — | 0.016 | — | 0.395 | 0.147 | 0.0103 |
| Tobacco.................... | 4124 | — | 1.16 | 0.360 | 0.150 | 0.004 to 0.010 |

—*E. N. Gathercoal.*

812. Cofman-Nicoresti, Jules. **The adulteration of olive oil.** Pharm. Jour. 104: 139. 1920.—A number of samples of olive oil recently examined were grossly adulterated with tea-seed oil, which has been condemned as an edible oil, on account of the presence of a poisonous saponin body in the pressed oil. The various commercial tea-seed oils possess physical constants very similar to olive oil and do not respond to Baudouin's or Halphen's tests. It may be detected by shaking 10 cc. of the sample oil with 10 cc. of a mixture of equal parts by weight of concentrated sulphuric acid, concentrated nitric acid and water. If tea-seed oil

exceeding 20 per cent is present, a distinct pink color will develop in the oily layer. If less than 20 per cent is present, the pink color is hardly distinguishable. Heating on a water-bath for 20 minutes tends to deepen the color. Some other oils, notably cotton-seed oil, also respond to this test but no pure olive oil does so.—*E. N. Gathercoal.*

813. Corfield, C. E., and E. Caird. **The fat of Momordica seeds.** Pharm. Jour. 104: 43. 1920.—An examination of the fat contained in the seeds of *Momordica cochinchinensis*, a cucurbitaceous plant indigenous to India, Formosa and the Philippines, indicates that it possesses certain characteristics of drying oils, without the property of producing a varnish as does linseed oil. After heating, it behaves as a semi-drying oil, and, admixed with drying oils, might be used in paints and varnishes. The seed kernels, by extraction with petroleum benzine, yield 47 per cent of fat. The fat obtained from the heated seeds by expression solidified on cooling to a pale green granular mass, easily liquified. On exposure to air and daylight it oxidized to a whitish mass easily pulverized. In a film exposed at 100°C., oxidation was complete in three days and the fat has assumed a stiff, granular, gelatinous form, easily disintegrated. The constants of the fat, its fatty acids and alcohols, indicate that it consists chiefly of the glyceryl esters of saturated fatty acids. Some unsaturated fatty acids are present but no wax-alcohols. The seeds contain no alkaloids.—*E. N. Gathercoal.*

814. Darbaker, Leasure K. **Vinegar bee.** Jour. Amer. Pharm. Assoc. 9: 510–512. 1920.—Author reports that in practically all vinegar bees examined there were present two main organisms: *Saccharomyces tyrisormis* and *Bacterium vermiformae*. Other organisms constantly found and isolated were *Mycoderma aceti* and *Mycoderma vini*. A discussion of these, as well as a number of other organisms follows.—*Anton Hogstad, Jr.*

815. Dott, D. B. **Opium assay from the international standpoint.** Pharm. Jour. 104: 199. 1920.—The desirability of internationally established processes of assay for potent drugs is indicated. The various opium assays of different pharmacopoeias are discussed. The process of the British Pharmacopoeia, with certain modifications adapted from the Japanese and the French pharmacopoeias, gave more accurate results in the hands of various workers than had hitherto been observed with any other process. Final titration rather than the weighing of the purified morphine was preferred and the elaborate process of the United States Pharmacopoeia was not approved.—*E. N. Gathercoal.*

816. Dox, Arthur W. **Notes on soy bean urease.** Amer. Jour. Pharm. 92: 153–157. 1920.—In a study of a number of different varieties of soy beans, as to the urease activity, the author reports that some difference exists, but that this difference appears to bear no relationship to the germinating power of the seed or the protein content of the latter. It was demonstrated that urease was in seeds that were practically dead. In regard to the best temperature to secure greatest activity, the author reports above 50° and probably below 60°.—*Anton Hogstad, Jr.*

817. Du Bois, Louis. **Cantharides assay.** Amer. Jour. Pharm. 92: 157–160. 1920.—A new method is given for the assay of cantharides, which is similar to that of Baudin, modified only so to make it a complete-extraction method, instead of an aliquot one, and which the author states is preferable to the present United States Pharmacopoeia method. The author states that the chief objection to the U. S. P. method is that lower results for both "combined and free" cantharidin were obtained by this than he obtained for "free cantharadin" alone by his method. The crystals obtained by the U. S. P. method were dark and resinous, while those obtained by the author's method were clean and white.—*Anton Hogstad, Jr.*

818. Farwell, O. A. **Adulteration of American centaury and maidenhair fern.** Bull. Pharm. 34: 238. 1920.—Three bales of American centaury examined by the author and weighing 472 pounds contained 113 pounds of drug true to name. The balance consisted of *Rhexia virginica* and *Stylosanthes biflora* which were not intermixed with the century but each species occupied a distinct layer by itself, the American centaury occupying the outermost por-

tion. In the case of the maidenhair fern, a layer of drug alternated with a shovelful of coarse gravel in regular succession. Five bags were examined, the total being increased 50 pounds by the gravel. In order to reduce the possibility of discovery to a minimum, each shovelful of gravel was deposited as nearly as possible in the middle of each layer of drug.—*H. W. Youngken.*

819. Garr, H. D., and George E. E'we. **Hemlock bark (Tsuga canadensis) for pharmaceutical purposes.** Jour. Amer. Pharm. Assoc. 9: 567–573. *3 fig.* 1920.—Evidence is presented to show the superiority of the rossed bark over the whole bark for pharmaceutical purposes. By separating and weighing the two portions, it was noted that the outer bark constituted 55.34 per cent while the inner bark was 44.66 per cent. In the percentage of extractive matter, using 32 per cent alcohol and hot water respectively, it was noted in general that there is no preference, quantitatively between the two barks, but qualitative preference is on the side of the extractive matter from the inner bark, since it is higher in tannin, oleoresin and volatile oil content and lower in the non-essential coloring and extractive matters. Tannin content is about 50 per cent greater in the inner bark. The outer bark contains, on the average, twice as much hot water-soluble coloring matter as the inner bark and 3½ times as much 32 per cent alcohol-soluble coloring matter. Microscopic examination showed a tremendously greater content of volatile oil and oleoresin content in the inner bark. Therefore the inner bark is to be preferred for pharmaceutical purposes. The microscopic structure and pharmaceutical uses are then discussed.—*Anton Hogstad, Jr.*

820. Holmes, E. M. **The importance of the medicinal plant and herb growing industry to Britain.** Chem. & Druggist 92: 421–22. 1920.—The Hungarian government has placed the medicinal herb industry under state control. The United States have exported *Cannabis Indica* of good medicinal value to England and are supplying Henbane, Belladonna and Digitalis to the British South African and Australian Colonies. Many American drugs can be grown readily in Britain. Among the almost unobtainable drug products of Russia are birch-tar oil (*Oleum Rusci*) which could easily and cheaply be obtained from the birch forests of Scotland; ergot, abundant in many rye fields and easily separated from the grain at the time of threshing; and santonin, obtainable from *Artemisia Gallica* var. *maritima*, which would probably do well in the salt marshes of Kent, where *Artemisia Gallica* flourishes. Many other drug and perfume plants and culinary herbs could be raised in Britain, in addition to those now profitably cultivated. The necessity of purity and quality and of government inspection is indicated.—*E. N. Gathercoal.*

821. Holmes, E. M. **The manna of the Scripture.** Chem. and Druggist 92: 25–26. 1920. —See Bot. Absts. 6, Entry 933.

822. Jermstad. **Vergleichende Untersuchungen und Identifizierung der vershiedenen Sorten von Rauchopium. [Comparative investigation and identification of different varieties of smoking opium].** [Rev. of: Simons, Fr. D. Journal of Industrial Engineering Chemistry, 1916, p. 345–351; and Pharm. Weekblad, 1919, p. 1540–1548.] Schweiz. Apotheker Zeitg. 20: 249–252. 1920.—Different methods of manufacture divide smoking opium into four classes: (1) That prepared by extracting gum opium with water, filtering and evaporating the filtrate to a syrupy liquid containing about 15–20 per cent of water. (2) That prepared by first, carefully heating, kneading and roasting before extracting with water. (3) A product obtained by using the opium obtained after processes 1 and 2, and admixing it with yen shee plus the scraped-out residue of the opium pipes. A detailed description of the properties used in the identification are given. The ash contents, charring temperature, and the melting points of the opium alkaloids are the diagnostic points of consideration used in the comparison. The average and range of alkaloids present in a good sample of opium are given in terms of percentage and also a quantitative method for the isolation of all the alkaloids present in the crude drug.—*B. H. Hoffstein.*

823. Maiden, J. H. **Plants which produce inflammation or irritation of the skin.** Agric. Gaz. New South Wales 31: 386. 1920.—Deals with a tree, *Pseudomorus Brunoniana.* Reference is given to previous articles dealing with other plants.—*L. R. Waldron.*

824. Smith, E. Philip. **Plant dermatitis.—I.** Jour. Botany 58: 130–135. 1920.—Plants causing irritation of human skin may be divided into two groups: those having an irritating cell-sap, and those in which the active principle is excreted. Of the former group four cases are discussed in the present paper. Nettle-poisoning is described as caused by the penetration of the skin by slender flask-like hairs, the tips of which break off, allowing the injection of the cell-sap containing formic acid, albuminoids, etc. Formic acid is not a sufficient cause of the irritation especially in extreme cases in the tropics. The symptoms are discussed. Primula-poisoning is due to an oil secreted in the terminal glands of glandular hairs. Cases of Primula-poisoning are sometimes severe. Rhus poisoning was found by Paff to be due to an oil, which he extracted and purified. This is produced by all parts of the plant, even the pollen. Thorough scrubbing with soap and water is the best remedy. In the Scilly Isles the flower pickers are troubled by a "lily disease" which is due to the juice of various species of *Narcissus*. Oil of jonquil is not the cause of this, but probably the raphides, which are abundant. An abraded skin seems prerequisite in this case.—*K. M. Wiegand.*

825. Smith, W. G. **Special strains of medicinal plants by selection.** Pharm. Jour. 104: 116. 1920.—While agricultural plant-breeding is largely done by public bodies and the results are published, experiments in medicinal plant-breeding are mostly by private cultivators, who naturally keep to themselves valuable information regarding improved production or quality. Cultivation, manuring and treatment may produce larger plants, but rarely change internal qualities such as the nature and yield of active principles. Increased yield or improved quality of active principles is brought about by the constant selection of the best individual plants in these respects and the production of pure lines from them. Hybridization, yielding new combinations, extends the range of possible improvement in any required direction. Many illustrations are cited, particularly, the great improvement made in recent years in French lavender with the development of *Lavendula vera fragrans* and *L. v. delphinensis;* and the increased yield and improved quality of Hungarian mint oils from *Mentha crispa* and *M. piperita;* and the greatly enriched strains of American grown belladonna, stramonium and hyoscyamus.—*E. N. Gathercoal.*

826. Viehoever, Arno, and Joseph F. Clevenger. **Relative content of volatile oil and ash in sage leaves and stems.** Jour. Amer. Pharm. Assoc. 9: 563–567. *2 fig.* 1920.—Examination of various parts of the sage plant, showed that the amount of volatile oil (volatile ether extract) found in the leaves was about three times as much as in the stem, the ratio being, 1.63:0.60, 1.26:0.49, 1.18:0.48, 1.06:0.29, 0.92:0.24; the herbaceous parts of the axis located close to or representing the top of the plant, yielded more volatile ether extract than the woody basal portions of the axis, the ratio being about 0.9 per cent : 0.2 per cent. Examination of material collected in Maryland and Virginia showed it to be below 1 per cent of volatile ether extract, which the authors state is quite likely explained by the fact that the material was collected in late summer or fall. Materials from Wisconsin yielded higher amounts. As the stems yielded considerably less of volatile ether extract than the leaves, a limitation of their amount is justified. Microscopic examination showed that the glands and glandular hairs containing the volatile oil are to be found only in the epidermis of leaves, petioles and herbaceous stems. They were found to be most abundant on the leaves, either upper or lower sides, and completely absent on woody stems.—Domestic sages indicate a tendency to possess a high total, and especially acid-insoluble, ash content. Leaves contain more ash than stems. A description of the glands and glandular hairs are included in the article.—*Anton Hogstad, Jr.*

827. Zakrzecki, H. L. H. **Java cinchona bark sales and analysis.** (Through Allgem. Landbouwweekblad voor Nederlandsch-Indië, Nov. 22, 1919.) Chem. & Druggist 92: 390. 1920.—Growers are required to present to the Quinine Bureau their analysis of the sample of bark sent to the quinine manufacturer. If the manufacturer's analysis of the sample is higher than the planter's, the latter hears nothing of it, but if the manufacturer's analysis is lower by 0.15 per cent or more, of quinine sulphate, he has the right to reject the planter's analysis

and demand a control analysis by analysts approved by the Quinine Bureau. As there are several methods of analysis for quinine-content in vogue—the gravimetric, polarimetric, etc., which vary somewhat in results—the Quinine Bureau is to appoint a Commission to study these in order to establish a uniform method with the ultimate object of creating a single, central analytical laboratory.—*E. N. Gathercoal.*

# PHYSIOLOGY

B. M. Duggar, *Editor*

Carroll W. Dodge, *Assistant Editor*

## DIFFUSION, PERMEABILITY

828. Loeb, J. **Influence of a slight modification of the collodion membrane on the sign of the electrification of water.** Jour. Gen. Physiol. 2: 255–271. 1920.—Continuing work previously reported, the author shows that in solutions of electrolytes which have a tendency to induce negative electrification of water, that is, in solutions of acids, acid salts, and salts with trivalent and tetravalent cations, the diffusion of the water depends, not only upon the concentration and nature of the salts, but also upon the previous treatment of the membrane. The treatment consisted in filling the collodion bags with 1 per cent gelatin solution and allowing them to stand over night. This was followed by very thorough washing in water. The differences in the osmotic behavior of the normal and treated collodion membranes seemed to be due, not to alterations in permeability of the membrane, but to the fact that water, in bags treated with gelatin, under the conditions named, diffuses as if positively charged. For instance, when solutions of acid are separated from pure water by a gelatin-treated collodion membrane, negative osmosis occurs, while, if a membrane, not so treated, is used, positive osmosis occurs. A treatment of the collodion membrane with casein, egg albumin, blood albumin, or edestin affects the behavior of the membrane as does treatment with gelatin. Treatments with peptone, alanine, or starch have no such effects.—*Otis F. Curtis.*

829. Loeb, J. **Influence of the concentration of electrolytes on some physical properties of colloids and of crystalloids.** Jour. Gen. Physiol. 2: 273–296. 1920.—The effects of adding an alkali or a neutral salt to a 1 per cent solution of metal gelatinate at $P_H = 8.4$ or to neutral solutions of salts with monovalent cations, such as $Na_2SO_4$ or $K_4Fe(CN)_6$, etc., at concentrations of M/256, are similar in that the initial rate of diffusion of water through untreated collodion membranes towards these solutions is decreased and the permanent osmotic pressure is also lessened. The effects of the addition of electrolytes on diffusion of water into neutral solutions of salts with monovalent or bivalent cations can be explained on the basis that the ions influence the electrification of water and the rate of diffusion of electrified water. The similarity in the effects of electrolytes on initial diffusion of water through a membrane towards either colloidal metal gelatinates or a crystalloidal salt, as well as the similarity in the effects on osmotic pressure, suggests that the explanation of the phenomena is the same. If this is the case, it raises the question whether the effects of ions on osmotic pressure of colloidal solutions, as well as on other physical properties of colloids, such as swelling, may be due, not to their colloidal properties, but to the more general effects of ions on the electrification of water and the diffusion of such electrified water through membranes. Not only was there a similarity in the effects of ions on the diffusion of positively charged water particles towards metal gelatinates and crystalloidal salts, but there was also a close similarity in the effects of acids and neutral salts on the diffusion of negatively electrified water towards gelatin-acid salts and crystalloidal salts.—*Otis F. Curtis.*

830. McCool, M. M., and C. F. Millar. **Further studies on the freezing point lowering of soils and plants.** Soil Sci. 9: 217–233. *3 pl.* 1920.—The amount of water which froze at −1.5°C. in the leaves of crop plants was found by the use of the dilatometer to vary with the

species of plant. In general the greater the freezing-point depression of the cell sap the less the amount of easily freezable water. The concentration of the cell sap of roots as measured by the freezing-point method is decidedly influenced by the concentration of the soil solution in which the plants are grown, but the concentration of the cell sap of the tops is not so markedly affected. The amount of water which froze at −2.5° and −4°C. in the tops of barley and corn was not markedly influenced by varying the concentration of the nutrient solution added to the soil when the water content of the soil was held constant. When grown in soil of high, medium, and low water content the plants in the soil of high water content possessed more easily freezable water. When the water content varied, but the concentration of the soil was held constant, more water froze at −2.5°C. in the leaves of plants grown in soils of low water content.—*W. J. Robbins.*

## MINERAL NUTRIENTS

831. Hartwell, Burt L., and S. C. Damon. **The value of sodium when potassium is insufficient.** Rhode Island Agric. Exp. Sta. Bull. 177. *39 p.* 1919.

832. Winslow, C.-E. A., and I. S. Falk. **The effect of mineral salts upon the viability of bacteria in water.** [Abstract.] Absts. Bact. 3: 5. 1919.

833. Aronovitch, B. **On the soluble toxic substances of the colon-typhoid group.** [Abstract.] Absts. Bact. 4: 9. 1920.

## METABOLISM (GENERAL)

834. Bridel, Marc. **Sur la présence simultanée du gentianose et du saccharose dans les espèces du genre Gentiana. [Simultaneous occurrence of gentianose and saccharose in Gentiana.]** Compt. Rend. Soc. Biol. Paris 83: 24–25. 1920.—In addition to *Gentiana lutea*, where these two sugars had already been reported, the author determined their presence in *G. asclepiodea*, *G. punctata*, *G. cruciata* and *G. purpurea*. From September to November the gentianose decreased while the saccharose increased in amount almost proportionally. It is suggested that these are convertible one into the other under the action of the enzyme gentiobiase.—*E. A. Bessey.*

835. Bronfenbrenner, J., and M. J. Schlesinger. **Carbohydrate fermentation by bacteria as influenced by the composition of the medium.** [Abstract.] Absts. Bact. 3: 8. 1919.

836. Cooledge, L. H., and R. W. Wyant. **The sanitary quality of milk as judged by the colorimetric hydrogen ion determination.** [Abstract.] Absts. Bact. 4: 6. 1920.

837. De Dominicis, A. **Sul significato biologico delle sostanze tanniche. Variazioni del contenuto in tannino nella corteccia di castagno secondo i mesi e le stagioni. [The biological significance of the tannins. Monthly and seasonal variations in the tannin content of the bark of the chestnut.]** Staz. Sper. Agr. Ital. 52: 305–331. 1919.—In order to decide upon the question as to whether the tannins are storage or secretory materials the author undertakes a study of the variation in tannin content of the bark of *Castanea* trees aged 2–5 and 20 years. The results are not readily summarized, but in general, the maximum content occurred at some time between early autumn and late winter, while in July—and usually as early as May—it was relatively low.—After a review of the chemical and physiological literature and a lengthy discussion the following conclusions are drawn. According to their origin, constitution, and physical and chemical properties the tannins should be considered in their main lines as glucosidal compounds, products of the etherification of an aromatic oxyacid and a sugar, generally glucose. The acids are of the fundamental types of gallic acid ($C_6H_2(OH)_3COOH$) and protocatechuic acid ($C_6H_3(OH)_2COOH$). The above-mentioned acids may be indirectly derived from quercitol and inositol. These conclusions regarding the derivation of the tannins and their glucosidal nature are upheld by their biogenetic, synthetic, and optical proper-

ties. Tannin is a strong protoplasmic poison since it strongly coagulates albumin. The author found that tannin would easily coagulate egg albumin when alone, but when acetic and tartaric acids were added, in small amounts in addition to tannin, coagulation did not take place. Citric acid was not quite as effective. Albumin coagulated by means of tannin would tend to return to its original sol condition after addition of acetic and tartaric acids. Tannin appears, and in fact accumulates, during the germination of some seeds in which it was not originally present. It can not, therefore, be considered as a reserve substance either for the sugar or the other substances it may contain; the latter would indeed be injurious if allowed to accumulate in the free state. The results of the investigation seem to justify the following interpretation as to the significance and behaviour of the tannins in the plant: The principal reason for the formation of these compounds is the property they have of being more easily oxidized than the phenolic acids from which they are derived, tannins being much more easily burned than gallic acid. This constitutes for the plant, deprived as it is of an excretory apparatus, a detail of the greatest importance, since it is a means of eliminating products that possess a high degree of toxicity. It is by this means that the tannins disappear by complete oxidation in fleshy fruits when their coagulating power is no more neutralized by the action of the organic acids which disappear during ripening. In other organs, instead, an equilibrium is established between the former or accumulated tannins and those which are destroyed by combustion. In peripheral organs such as the bark, directly exposed to the action of atmospheric oxygen and to the influence of fluctuating external factors, the equilibrium is subject to many fluctuations, especially is oxidation intensified with increase of temperature, reaching a maximum during the warmest summer months. Tannins as glucosides are then to be considered as refuse materials which the plant easily destroys, utilizing the process of combustion, thereby initiated, for "vital" purposes.—*A. Bonazzi.*

838. Gerhardt, Karl. **Die Exkretion und ihre Bedeutung im Leben der Pflanze. [Excretion and its importance in plant life.]** Naturwissenschaften 8: 7-8. 1920.—The work of Benecke, Amar, and especially Stahl, has shown that the oxalic acid formed in respiration and possibly in assimilation, neutralizes the surplus (harmful) calcium in the plant. This explanation of the rôle of oxalic acid has contributed much to a new understanding of the exudation of water by the plant. This explanation of guttation, as developed mainly by Stahl, is discussed at length.—*Orton L. Clark.*

839. Gola, G. **Sulla presenza, nella plante, di composti ematoidi di ferro. [The presence of haematin in plants.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[2]: 146-150. 1919.—From organic plant material, notably the leaves of *Lemna* and other water plants, when extracted with boiling dilute HCl, a solution is obtained which shows positive peroxidase properties. This solution was free from iron. If on the other hand you repeat the extraction with ammonia, thereby getting the iron in solution, you obtain a residue which reacts positively, although the iron has been extracted. This seems to indicate that in plants Bach's theory, that the enzymatic peroxidase reaction is not dependent on iron, holds true; and further, that the reaction is comparable to that obtained in animal chemistry, namely, that the peroxidase property of the blood is not due to a combination of the iron with the organic molecule. In this connection it is of interest to note that as regards distribution of the enzyme in plants, most of it is found in the peripheral parts of the plant, in the tissues of the phloem and the medullary rays, and that it is scarce in green tissues.—*E. F. Artschwager.*

840. Greig-Smith, R. **Contributions to our knowledge of soil-fertility. XVI. The search for toxin-producers.** Proc. Linnean Soc. New South Wales 43: 142-190. 1918.—See Bot. Absts. 5, Entry 2281.

841. Itano, Arao, James Neill, and Mary E. Garvey. **Limiting and optimum reactions for growth of B. botulinus and organisms isolated from food.** [Abstract.] Absts. Bact. 4: 3. 1920.

842. Masoni, G. **Saggi sui succhi radicali. Prima nota. [Tests on root saps. First contribution.]** Staz. Sper. Agr. Ital. 52: 569–583. 1919.—The present investigation was undertaken by the author in connection with the question of chlorosis of plants due to excess of calcium in the soil, and it covers only one phase of the question as it relates to the behaviour of the root sap to various solutions rather than the root excretions. Experiments were made with *Cichorium*, *Zea*, *Lupinus* and *Daucus* by crushing the roots and extracting them with cold water and using the filtered solution. Solutions of ferric chloride 1–2 per cent were added in the presence or absence of an alkaline solution of ammonia, or lime water. In other cases ferric citrate, citric acid, nitric acid, acetic acid, dipotassium citrate, sodium acetate, glucose, and saccharose were used together with the ferric solution. The results of the investigation are thus summarized: Under equal conditions juices of various plants act differently towards the ferric solutions, some causing a complete precipitation of the iron—although the solution be acid—others leaving the iron in solution. The presence of ferric citrate, citric acid, or dipotassium citrate avoids the precipitation of the iron. This action is not exerted by equivalent amounts of acetic acid, sodium acetate, or nitric acid. Sugars have only a negligible action in preventing the iron from becoming insoluble, and in concentrations of as much as 40 per cent of saccharose the action was very slight. The juice of *Daucus* was the most active in maintaining the iron in solution, while the juice of *Lupinus* and *Zea* follow in the order given. In the latter plant the sap of the stalk at flowering time gave the same reaction as the root sap. The author excludes the possibility that the insolubility may be due to the action of tannic substances, and is more inclined to believe that the phenomenon is due to the combined action of colloids, proteins, and possibly also to the phosphates to be found in the juices. The method is, according to the author, applicable to the study of the fate of ferric substances after their entrance into the plant rather than to their preparation for absorption by the plant. The principal consideration in these investigations is the assumption of two sets of substances active in this connection: the one—probably made up of proteins—capable of rendering the iron insoluble, and the other capable both of counteracting this first one and of dissolving the precipitate after it has been formed. Therefore the circulation of mineral iron in the plant is dependent upon these two groups of substances, and this condition may have an important bearing upon the adaptation of plants to various media.—*A. Bonazzi.*

843. Olitsky, Peter K., and I. J. Kligler. **Toxins and antitoxins of B. dysenteriae Shiga.** [Abstract.] Absts. Bact. 4: 18. 1920.

844. Teodoresco, Em. C. **Sur la présence d'une phycoérythrine dans le Nostoc commune. [On the presence of a phycoerythrin in Nostoc commune.]** Rev. Gén. Bot. 32: 145–160. *2 pl. 4 fig.* 1920.—*Nostoc commune* varies widely in color. The author found material giving red pigment, but no blue pigment, in solution when macerated. Both pigments (phycoerythrin and phycocyanin) are usually present in varying proportions. Solutions of many shades of color ranging from red through blue to violet were also obtained from other material. From all of them a red pigment was isolated by differential capillary absorption by filter paper. The red aqueous solution obtained when red zones of filter paper were placed in water had a yellow-orange fluorescence like that of phycoerythrin. Its spectrum showed the same 3 absorption bands with the same relative intensities as are seen in phycoerythrin from *Ceramium rubrum* and other red algae (Kylin and other authors) as well as in the red pigment from *Oscillatoria Cortiana* (Bocat). Its reaction to acids, alkalies, and other reagents are essentially the same as those of phycoerythrin from red algae. Solutions of the red pigment to which antiseptics had been added, and which were kept in the dark, remained unchanged for 2 years. When such precautions were not taken decomposition occurred. During the first stages of this decomposition the relative intensity of the 3 absorption bands is reversed, precisely as in the case of phycoerythrin from *Ceramium* and also the red pigment from *Oscillatoria* (Gaidukow).—The author concludes that the red pigment in *Nostoc commune* and other Cyanophyceae is the same as that in the Florideae, and not merely a variety of phycocyanin to which it is closely related, but from which it differs decidedly in its spectrum. Phycoery-

thrin in Cyanophyceae probably arises by transformation of phycocyanin, since the two pigments vary in the plant in inverse ratio. The red pigment of certain Myxophyceae (Sauvageau) is regarded as phycoerythrin by the author.—*L. W. Sharp.*

## METABOLISM (NITROGEN RELATIONS)

845. Blish, M. J. **Effect of premature freezing on composition of wheat.** Jour. Agric. Res. 19: 181–188. 1920.—This is an investigation of the effect of premature freezing on the more important chemical constituents of the wheat (*Triticum*) kernel, with special reference to the nitrogen compounds, from which gluten is formed. Frozen wheat contains larger amounts of nonprotein nitrogen, reducing sugars, and acid-reacting substances than does sound wheat. The nonprotein nitrogen of frozen wheat carries a considerably higher percentage of a-amino nitrogen than that of sound wheat.—*D. Reddick.*

846. Cauda, A. **Gruppi vegetali fissatori di azoto libero. [Plant groups that fix free nitrogen.]** Nuovo Gior. Bot. Ital. 26: 169–178. 1919.—*Bacillus Cruciferae*, isolated from the roots of various cruciferous plants (*Raphanus, Sinapus, Brassica*) was found to fix free nitrogen, especially when cultivated on liquid media having an excess of calcium carbonate and a deficiency of nitrogen. The amount of nitrogen fixed by the organism nearly equals that obtained from *Azotobacter* and surpasses *Bacillus radicicola. Bacillus Cruciferae* forms round, whitish colonies of viscid consistency. Older colonies turn yellow, rose, or red brown. The organism is rod shaped and forms chains; it is stained yellow with potassium iodide and blue with Löffler's stain and methylene blue.—*Ernst Artschwager.*

847. Davis, Lewis, and Newell S. Ferry. **Studies on diphtheria toxin. II. The rôle of the amino acids in the metabolism of Bacterium diphtheriae.** [Abstract.] Absts. Bact. 3: 9–10. 1919.

848. Sani, Giovanni. **Intorno all'attività riduttrice delle radici delle graminaceae: la riduzione del nitrato di calcio per le radici delle graminacee. [Reduction of calcium nitrate by roots of the Graminaceae.]** Atti R. Accad. Lincei Roma Rend. (Cl. Fis. Mat. e Nat.) 28[2]: 199–201. 1919.—The theories regarding the reduction of nitrates in plants are reviewed as an introduction to a series of articles on this subject. [See also next following Entry, 849.] —*F. M. Blodgett.*

849. Sani, Giovanni. **Intorno alla attività ridduttrice della radici delle graminacee: la riduzione del nitrato di calcio per le radici graminacee. Nota II. [The reduction of calcium nitrate by roots of the Graminaceae.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[2]: 244–247. 1919.—The extracts of the roots of wheat, oats, barley, and corn were found to contain a reducing substance when tested either as an aqueous extract or after purifying. It was also found that extracts made from the roots of maize and wheat reduced calcium nitrate solution. This reducing action came to a stop after a certain concentration was reached and was inhibited entirely by an alkaline solution of Rochelle salt. [See also next preceding Entry, 848.]—*F. M. Blodgett.*

## METABOLISM (ENZYMES, FERMENTATION)

850. Cauda, A. **Prove di fermentazione vinosa con aggiunta di lieviti purificati. [Investigations upon alcholic fermentation with purified yeasts.]** Staz. Sper. Agr. Ital. 52: 524–533. 1919.

851. Chesnut, V. K. **Report on papain.** Jour. Assoc. Official Agric. Chem. 3: 387-397. 1920.—A study of *Papaya* latex, especially its enzyme action.—*F. M. Schertz.*

852. Clark, Mansfield. **The production and activity of proteus gelatinase in relation to $P_H$.** [Abstract.] Absts. Bact. 4: 2. 1920.

853. Dox, Arthur W., and Lester Yoder. **Influence of fermentation on the starch content of experimental silage.** Jour. Agric. Res. 19: 173-179. 1920.—Starch constitutes about 10 per cent of maize at the time of ensiling. Studies of silage at different stages in the fermentation process show that changes in acidity, alcohol, and sugar are entirely independent of the starch content of the ensiled maize, and that the starch content remains constant throughout the process. The granules remain intact, undergoing no detectable physical change.—*D. Reddick.*

854. Effront, Jean. **Sur la relation entre l'accroissement des cellules et la production des enzymes. [Relation between cell growth and enzyme production.]** Compt. Rend. Soc. Biol. Paris 83: 194-195. 1920.—Experimenting with "top-yeast" in solutions of increasing degrees of alkalinity the author finds that fermentation of the sugar, that is, enzyme production, occurs at a degree of alkalinity considerably beyond that at which growth or production of new cells takes place.—*E. A. Bessey.*

855. Maestrini, D. **Contributo alla conoscenza degli enzimi. I: Amilasi dell'orzo germogliato. [Amylase of germinating barley.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[2]: 393-394. 1919.—While amylase of germinating barley may be extracted with distilled water it is more active when this is acidified with acetic acid, and the extraction should have a duration of 6 hours. The soluble starch of commerce is strongly split up by this extract even in neutral solution; the other starches are not split if not first reduced to a paste and if not in solutions of a certain acidity. The source of starch does not perceptibly affect the amylolytic activity. Hydrochloric and acetic acid hasten the action in nearly the same manner. Potassium hydroxide acting for ten hours paralyses the amylolytic activity. The invert sugar produced is a maximum at about 45°C., at 50° the amount of invert sugar diminishes, and it is zero at 70°.—*F. M. Blodgett.*

856. Simon, René. **Contribution à l'étude de la digestion des tissus végétaux. [The digestion of plant tissue.]** Actes Soc. Linneenne Bordeaux (Proces-verbaux) 68: 87-98. 1914. [Received May, 1920].—The progress of pectose digestion was observed by appropriate means in thin sections of roots, leaves, and germinating seeds. After the alteration of the pectose of the middle lamella the cell walls tend to dissociate. The initial stages of digestion and the subsequent transformations of pectose are made visible by first treating thin sections of plant tissue in a dilute acid (1-2 per cent HCl) for 5 minutes. The acid hydrolizes the pectose in all parts of the plant tissue, but the progress of digestion will be more advanced in those parts in which digestion had started before the initial treatment. The plant tissue is next immersed in a saturated aqueous solution of ammonium oxalate or an alkaline salt, and finally, after washing in water, is stained with Ruthenium red. Pectose which remains unmodified will be soluble in water or alkaline solutions and will not be stained. Pectose-pectin, one of the products of digestion, will be insoluble in water and easily colored by basic dyes.—*W. H. Emig.*

## METABOLISM (RESPIRATION)

857. Molliard, M. **Influence de la réaction du milieu sur la respiration du Sterigmatocystis nigra. [Influence of the reaction of the culture medium upon the respiration of Sterigmatocystis nigra.]** Compt. Rend. Soc. Biol. Paris 83: 50-51. 1920.—When grown in saccharose solution of varying degrees of acidity ($H_2SO_4$) or alkalinity ($Na_2CO_3$) the production of oxalic acid does not appear at an acidity beyond N/50 and steadily increases with the alkalinity to a maximum at 3N/50. Beyond N/12.5 no acid is formed. Allowing for the $CO_2$ disengaged from the $Na_2CO_3$ by the oxalic acid the amount of this gas set free by respiratory processes increases rapidly as the acidity diminishes from N/10 reaching a maximum at N/50 alkalinity and diminishing slowly to 3N/50 and very rapidly thence to N/12.5. The absorption of oxygen parallels this exactly, the respiratory quotient averaging about 0.90.—*E. A. Bessey.*

## ORGANISM AS A WHOLE

858. Meader, P. D., and G. H. Robinson. **Some physical and biological properties of the streptococcus hemotoxin.** [Abstract.] Absts. Bact. 4: 17. 1920.

859. Pringsheim, Hans. **Symbiose bei Bakteria.** **[Symbiosis of bacteria.]** Naturwissenschaften 8: 101–103. 1920.

860. W[inslow], C.-E. A. **The lactic acid bacteria.** [Rev. of: Orla-Jensen, S. **The lactic acid bacteria.** Mem. Acad. R. Sci. et Let. Danemark (Sect. Sci.) VIII, 5: 81–196. *51 pl.* 1919.] Absts. Bact. 4: 102. 1920.—See Bot. Absts. 6, Entry 183.

## GROWTH, DEVELOPMENT, REPRODUCTION

861. Coupin, H. **Sur les causes de l'élongation de la tige des plantes étiolées.** **[The causes of stem elongation in etiolated plants.]** Compt. Rend. Acad. Sci. Paris 170: 189–191. 1920.—In a study of etiolation in seedlings of white lupine it is found that the rate and the total amount of elongation of the hypocotyls and the roots of plants growing in the dark may be prevented from materially exceeding that of seedlings grown in light, if there is added to the media in which the seedlings are grown a quantity of the expressed sap of seedlings grown in light. It is therefore concluded that chloroplasts in the presence of light produce a substance which though not entirely toxic has a retarding effect upon the rate of growth. Thus the expressed sap of green seedlings reduces the rate of growth of plants growing in darkness, whereas in plants grown in darkness in water or in a solution containing the expressed sap of etiolated plants the ordinary rapid elongation characteristic of etiolation takes place.—*C. H. & W. K. Farr.*

862. Marshall, Max Skidmore. **Association of Bacillus subtilis and Streptococcus lacticus.** [Abstract.] Absts. Bact. 4: 5. 1920.

863. Mitscherlich, E. A. **Das Liebigsche Gesetz vom Minimum und das Wirkungsgesetz der Wachstumfactoren.** **[Liebig's Law of the Minimum and the "effect rule" of growth factors.]** Naturwissenschaften 8: 85–88. 1920.—Mitscherlich doubts the truth of Liebig's Law, and he asks and attempts to answer the following questions: (1) Does the amount of plant production depend on only one vegetation factor, the so-called minimum factor? (2) According to what proportionality may this be true? He then formulates and illustrates with curves the law of physiological relation, or better, the effect law of growth factors, and points out that there can be no such thing as one minimum factor alone determining the amount of plant production, but that all growth factors together have a very definite influence on production.—*Orton L. Clark.*

864. Molliard, M. **Tuberisation asèptique de la carotte et du dahlia.** **[Tuber formation of carrot and dahlia under aseptic conditions.]** Compt. Rend. Soc. Biol. Paris 83: 138–140. 1920.—When grown free from bacteria or fungi carrots and dahlias formed their normal roots or tubers, respectively, showing that the presence of a symbiotic fungus is not necessary for this process.—*E. A. Bessey.*

865. Popoff, Methodi. **Artificial parthenogenesis and cell stimulants.** Sci. Amer. Monthly 1: 312–316. *1 fig.* 1920. [Translated from Biol. Centralbl. (Leipzig), April 20, 1916.]

866. Urbain, A. **Influence des matières de réserve de l'albumen de la graine sur le developpement de l'embryon.** **[Influence of the reserve materials of the endosperm upon the development of the embryo.]** Rev. Gén. Bot. 32: 125–139, 165–191. *24 fig.* 1920.—The author reports notable success in rearing embryos which have been separated from their endosperms. Several species were used, including wheat, oats, barley, *Mirabilis jalapa*, *Daucus carota*, *Nigella hispanica*, *Spinacea oleracea* and *Pinus pinea*.—Experiments on wheat, oats, and

barley were conducted as follows: Grains were soaked in water; after 3 hours 5 embryos were isolated and placed on blotting paper wet with nutrient solution (lot $P_1$); one day later 5 more were similarly treated (lot $P_2$) the next day 5 more were similarly treated (lot $P_3$). In $P_2$ the growth of the embryo had begun; in $P_3$ and in checks (embryos not separated from endosperm) the plumule had become green, but the endosperm had decreased only slightly in weight. On the third day measurements and weighings showed that the plumule and first adventitious root were nearly twice as long in $P_3$ and $P_1$, and that $P_3$ had gained from 2½ (barley) to 6½ (wheat) times as much weight as had $P_1$. On the seventh and twentieth days all lots were growing, but checks and $P_3$ were much better developed than $P_1$ and $P_1$. From this and several other experiments it is concluded that in no case is endosperm indispensable to the development of the plantlet; all species treated can grow in nutrient solution. The removal of the endosperm retards the life processes of the embryo; its presence favors the development of the plantlet during the first few days and results in marked changes later. However, since the amount of endosperm material consumed by the third day is so slight this effect must be due to some stimulus exciting enzymatic activity and the use of reserve materials within the embryo itself.—Plants of all lots were raised to maturity in soil. Although plants of lot $P_1$ were often nearly as well developed as the checks, those of lots $P_1$ and $P_2$ showed more pronounced modifications: roots less branched; stems simpler; leaves smaller, less numerous and simpler in form; inflorescence precocious, less well developed and showing various abnormalities; fruits often aborted; all parts dwarfed.—A comparison of sections of $P_1$ plants and the checks in *Ricinus*, *Nigella*, *Papaver*, *Solanum*, *Torilis*, and *Zea*, showed the internal structure to be much simpler in the plant which had been deprived of their endosperm. In the stem the cells are fewer and smaller; the cortex shows fewer layers; the tissues of the central cylinder are less differentiated, the vascular bundles being fewer and with fewer elements; the pith is relatively large. Similar modifications are present in root and petiole. In the leaf the epidermis appears nearly normal, but the other tissues show reduction in the number and size of their elements. The greater the dwarfing the more pronounced are these modifications. —*L. W. Sharp.*

## REGENERATION

867. Loeb, J. **Quantitative laws in regeneration.** I. Jour. Gen. Physiol. 2: 297–307. 1920.—Dry weight measurements show that, when a piece of stem of *Bryophyllum calycinum* inhibits the production of shoots and roots in an attached leaf, the stem gains in weight and this gain approximately equals the mass of shoots and roots that the leaf would have produced if it had been detached from the stem. "This suggests that the inhibitory influence of the stem upon the formation of shoots and roots in the leaf is due to the fact that the material available for the process naturally flows into the stem."—*Otis F. Curtis.*

868. Okada, Yoonosuke. **Studien über der Proliferation der Markholenzellen im Stengel der Vicia faba. [Studies on the proliferation of pith cells in the stem of Vicia faba.]** Bot. Mag. Tokyo 34: 19–34. *4 photog., 7 fig.* 1920.—This paper gives a brief review of the literature and describes the author's methods and results. The hollow stems were injected by means of a glass hypodermic syringe with distilled water and various dilute salt solutions, sugar, glycerine, alcohol, and ammonia in different concentrations and at different temperatures. Temperature had little effect and dilute solutions differed little or not at all from water. More concentrated solutions failed uniformly to produce any proliferation. The author concludes that water absorption and increased turgor are the chief causes of the hypertrophy and the division of the pith cells. From one to seven injections were made in each stem, resulting in intumescences in the majority of cases. The entire cavity was sometimes filled. Acids and a substance turning orange red with $H_2O_2$ accumulated in the affected cells.—*Leonas L. Burlingame.*

## TEMPERATURE RELATIONS

869. Bigelow, W. D., and J. R. Esty. **The thermal death point in relation to time of some resistant organisms.** [Abstract.] Absts. Bact. 4: 10. 1920.

870. Gain, Edmond, and André Gain. **Conditions thermiques du sol sous l'influence de la végétation locale. [Thermal conditions of the soil under the influence of local vegetation.]** Rev. Gén. Bot. 32: 161–164. 1920.—See Bot. Absts. 6, Entry 299.

## RADIANT ENERGY RELATIONS

871. Denis, Marcél. **L'optimum lumineux pour la developpement du Stichococcus bacillaris Nag. [Optimum light for Stichococcus bacillaris Nag.]** Rev. Gén. Bot. 32: 72–77. 1920. —Pure culture of *Stichococcus bacillaris* produced the greatest dry weight of growth in Detmers' nutrient solution when exposed to rather weak illumination. In direct sunlight the cells were yellow-green and more or less spherical. In tap water initial development was possible in all light-intensities tried, but continued growth was prevented by the inability to fix free nitrogen.—*F. B. Wann.*

872. Eberson, Frederick. **Ultraviolet rays and their effect on antigenic properties. I. Ultraviolet light and meningococci.** [Abstract.] Absts. Bact. 4: 21–22. 1920.

## MISCELLANEOUS

873. Cheplin, Harry A., and Leo F. Rettger. **Studies on the transformation of the intestinal flora.** [Abstract.] Absts. Bact. 4: 8. 1920.

874. Clark, Mansfield. **Reduction potential in its relation to bacteriology.** [Abstract.] Absts. Bact. 4: 2. 1920.

875. Koketsu, Riichiro. **Time records for physiology, ecology, and climatology.** Bot. Mag. Tokyo 34: 13–14. 1920.—Since physiological processes are related to actual solar time, the author suggests that records expressed in the ordinary standard time are not properly comparable. He suggests their translation into solar time for publication, the more particularly so that many countries have now adopted the custom of changing their clocks in conformity with the so-called daylight-saving laws.—*Leonas L. Burlingame.*

876. Kopeloff, Nicholas, and Lillian Kopeloff. **Biological factors in sugar-deterioration.** [Abstract.] Absts. Bact. 4: 7. 1920.

877. Rogers, L. A., and C. L. McArthur. **Variation in the colon count in Potomac river water.** [Abstract.] Absts. Bact. 3: 1. 1919.

878. Rogers, L. A. **An improved apparatus for drying cultures by the freezing method.** [Abstract.] Absts. Bact. 3: 6. 1919.

# BOTANICAL ABSTRACTS

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## AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

879. ADDIS, JOSE M. **El bledo manso. (Amaranthus blitum L.). [Pig weed.]** Revist. Agric. Com. y Trab. 3: 74–75. *1 fig.* 1920.—It is pointed out that this weed has been used as a food for hogs. An analysis is published indicating that it is of considerable value.—*F. M. Blodgett.*

880. AHR, J., AND CHR. MAYR. **Gerstensorten und Dungung. [Barley varieties and manuring.]** *123 p.* Datterer & Cie.: Freising, Germany, 1919. M. 3.50.—Short rev. in Jour. Landw. 67: 287. 1919.

881. ANONYMOUS. **Solanacea cubana gigantesca como planta forragera. La yerba de soler. [A large Cuban forage plant. The soler plant.]** Revist. Agric. Com. y Trab. 3: 93–95. *4 fig.* 1920.—It was discovered that horses and cattle showed a great liking for the foliage of *Solanum verbascifolium* L. An analysis indicated considerable feed value, being high in protein.—*F. M. Blodgett.*

882. ANONYMOUS. **The Uba cane.** Internat. Sugar Jour. 22: 300–301. 1920.—This article discusses various accounts given for the origin of Uba cane. Experiments with a sport of the Uba cane are being carried out on the Natal Estates. The new variety seems to be very hardy, a vigorous grower and more capable of withstanding drought and disease than the older established Uba. The sport was found in a field of second ratoons and propagation cuttings were taken from the stool. Nearly 300 acres of the sport are under cultivation.—*E. Koch.*

883. ANONYMOUS. **The Uba cane. Some further data as to its origin.** Internat. Sugar Jour. 22: 326–328. 1920.—An anonymous writer in the South African Sugar Journal suggests the derivation of the name Uba and origin of Uba cane in Natal. A box of tops had been sent to Natal from Poona, India. Three letters were on the label from which *Uba* was read—it was assumed that the last three letters of Poona read like *Uba*. This is somewhat like the position taken by HARRIS, who supposes the name to have come from a damaged label, *Uba* being part of name "Boubaya" (a Madagascar cane) which reached Natal via India whence it was brought by MITCHELL in 1885. WATTS writes of the existence of Uba cane in Brazil quite fifty years ago but he does not think it of Brazilian origin, nor that the name is derived from "viba" (meaning reed) which MR. NOEL DEERR is inclined to believe.—*E. Koch.*

884. Barber, C. A. **Sugar cane seedling work in India. Part II.** Internat. Sugar Jour. **22:** 307–312. *2 pl., 4 fig.* 1920.—The work on the crossing of sugar cane in developing canes suited to North Indian conditions has been successful, due to the selection of fertile-styled, pollen-sterile mothers. Many suitable mothers without pollen and with starch-filled styles have been found, and a large number of undoubted crosses are now being obtained every year, with thin indigenous Indian canes and thick tropical canes of good quality, among which there no doubt will be many suited to North India. A detailed study of seedlings shows variations among them in small particulars—such as size and shape, width of leaf and thickness of stem, color marks in various parts, and general habit. An attempt was made to study correlations between the external morphology of the cane plant and the richness of its juice. There appears to be a very definite negative correlation between (1) leaf width and leaf length and (2) richness of juice; the module of the leaf (length divided by width) gave equally definite positive correlation with sugar content as did also length of cane; thickness of cane yielded no definite correlation to richness of juice, but there were indications that thinner varieties have a richer juice. The cages used in crossing the canes and the methods employed are described, and a list of publications prepared by workers on the cane-breeding station at Coimbatore is given.—*E. Koch.*

885. Barber, C. A. **The growth of the sugar cane.** Internat. Sugar Jour. **22:** 313–317. *1 fig.* 1920.—The sixth article of a series. Shows how connected study of growth of stem and leaves of cane plant has been rendered possible, and reviews Kammerling's work on the relative growth of joint, sheath and blade, and the more recent and up-to-date work of Knijper.—*E. Koch.*

886. Barber, C. A. **The growth of the sugar cane. VII.** Internat. Sugar Jour. **22:** 371–375. *1 pl., 1 fig.* 1920.—Length of cane depends on length of individual joints and their number. Height of field cane varies according to weather, soil, cultivation and amount of manure applied the effect being seen in the length of the joints rather than in the number produced. Length of joint is also affected by the period in which the cane is formed, the first formed canes having shorter joints than those arising later, but earlier canes produce so many joints that these canes are usually longer. In each individual cane the length of the joint varies in the different parts of the cane, joints below the ground being extremely short and disc-like, the length rapidly increasing above ground until after the period of active growth, when joints become shorter. When flowering occurs the joints at the top become longer, leaf sheaths are longer, blades shorter and joints decrease in thickness. The longest joints, on an average, are the fifth and sixth joints above ground, each increasing until the maximum is reached, after which a regular decrease takes place. A series of measurements made at crop time may be relied upon to reproduce the character of the cane growth throughout the season that has passed. The length curve of the joints taken at harvest shows the nature of the past growing season and any abnormality will make itself clearly noticeable. From a study of the joint and other growth curves the suitability of a tract for cane growing in general may be judged.—*E. Koch.*

887. Barber, C. A. **Sugar cane seedling work in India.** Part I. Internat. Sugar Jour. **22:** 251–257. 1920.—Work in progress at Coimbatore Cane-breeding Station deals not merely with the raising of cane from thick, tropical parents, but also aims to obtain definite crosses between these and the many thin, indigenous Indian canes; it also aims to obtain sets of seedlings suited to the several different conditions of the Indian sugar tracts. Attempts were made to raise seedlings, but these failed because arrowing is rare in North India, and it was found that when it occurred the stamens were almost invariably completely closed and without pollen. Arrowing in India is affected by latitude, by time of planting and by the character of the soil and its treatment, while the usefulness of the arrows for the production of seedlings depends, in the first instance, on their possession of abundance of open anthers. It appears that the amount and character of the rainfall may be directly influential. Arrows vary as much in female fertility as in the fertility of the male organs. If the stigma and style contain starch it is probable that the flowers are capable of producing seed and seedlings. Each

variety has its particular time of flowering, thick canes, as a class, flowering earlier than thin ones. In a group of thick cane seedlings a small proportion show differences from the usual type. These produce masses of flowers that are especially fertile, yielding great numbers of viable seeds. They flower early and are used for crossing with thick canes. Wild canes have been used similarly. Various devices have been used to hasten the later flowering of the thin canes and retard the early flowering of the thick canes, with the result that some of the former have been hastened and a number of crosses formerly unobtainable have been secured. Different varieties and groups show great diversity in development of arrows. The fullest development is found in various highly developed thick canes, as well as in the most primitive class of the Indian indigenous ones. Many of the North Indian canes have been induced to flower for the first time and with further study the tardy, and at present infertile, members may some day produce flowers which will add to the range of possible crosses.—*E. Koch.*

888. Blair, T. A. **A statistical study of weather factors affecting the yield of winter wheat in Ohio.** Monthly Weather Rev. **47**: 841–847. *2 fig.* 1919.—The statistical method is applied to the problem of determining what are the important factors affecting the growth of winter wheat in Ohio, and their relative importance. The results are expressed as partial correlation coefficients and in linear regression equations, in which the coefficients are evaluated by the method of least squares. Temperature and precipitation are used because of their general nature and because observations of these features extend over the entire region. Temperature variations have more influence upon the yield than do precipitation variations, because of the regular and frequent storms peculiar to the region. Calculated yields agreed very closely with those given by the U. S. Bureau of Crop Estimates. The chief requisites for a good yield are a warm March and June and a cool and dry May. The critical periods in the growth of the plant are those connected with "jointing," "heading" and "filling."—*E. N. Munns.*

889. Cross, W. E. **Cane nomenclature in Argentina.** Internat. Sugar Jour. **22**: 278–279. 1920.

890. Gerlach, Prof. Dr. **Kohlensaüredungung. [Fertilizing with carbon dioxide.]** Mitteil. Deutsch. Landw. Ges. **35**: 370–371. 1920.—The experiments on the effect of increasing the carbon dioxide content of the air, first reported in this journal in 1919 (no. 5), were repeated in a light, airy greenhouse. In a small section of the house the air was made to contain 23 times as much carbon dioxide as it had before the experiment. No beneficial results were obtained, as is evident from the following condensed summary of the harvested dry matter from the three plants named.

| | TOBACCO | MAIZE | WHITE MUSTARD | TOMATO FRUITS |
|---|---|---|---|---|
| In the open | 100 | 100 | 100 | 100 |
| In glass house without extra $CO_2$ | 100 | 75 | 88 | 98 |
| In glass house with extra $CO_2$ | 105 | 80 | 66 | 73 |

—*A. J. Pieters.*

891. Howard, Albert, Gabriel L. C. Howard, and Abdur Rahman Khan. **Studies in the pollination of Indian crops. I.** Mem. Dept. Agric. India. (Bot. Ser.) **10**: 195–220. 1919. —A report on the flowering, methods of pollination, fertilization, natural cross fertilization and improvement of leguminous crops, such as *Crotalaria juncea*, *Cajanus indicus Spreng.*, *Indigofera arrecta Hochst.*, *Indigofera sumatrana Gaertn.*; oil-seed crops, such as *Linum usitatissimum L.*, *Eruca sativa Lam.*, *Sesamum indicum L.*, *Guizotia abyssinica Cass.*; and crops grown for fiber, such as *Corchorus capsularis L.*, *Corchorus olitorius L.*, and *Hibiscus sabdariffa L.*—*F. M. Scherts.*

892. Keitt, T. E., and A. W. Murray. **The influence of certain factors on the time of opening of cotton.** Georgia Agric. Exp. Sta. Bull. 130: 17–34. *3 fig.* 1919.—Information relative to the development of the cotton plant and the early opening of the flower is important owing to the rapid advance of the boll weevil. In the variety tests six strains of Cleveland Big Boll led all others. On heavy clay the largest yield was obtained with 600 pounds 3-8-2 fertilizer. This gave also the highest yield to October 1st, on this type of soil, and the highest per cent open October 1st. The highest yield on the medium clay was obtained where 600 pounds of an 8-3-9-formula was used. On this soil the highest yield to October was with 600 pounds of an 8-3-6. This result shows that on this type of soil the farmers should continue to use potash under heavy boll weevil infestations. The highest yield on the sandy soil was obtained where 600 pounds of an 8-3-6-formula were used, but the largest yield to October 1st, was where 600 pounds of 8-3-3-formula were used. Acid phosphate has hastened the maturity of cotton. This is also true of Tennessee blue rock phosphate. Ground or raw rock phosphate seemed, in the main, to hasten maturity. Where lime was used with acid phosphate the maturity was delayed. For the season of 1919 late topdressing with a mixture of ammonia and nitrate of soda gave profitable increases in yield. The addition of potash to nitrogen in topdressing did not seem to delay maturity, although the results do not indicate a profit from this practice.—*T. H. McHatton.*

893. Koch, L. **De waarde van stekken en van knol unitloopers als bibit voor het planten van bataten. [Value of cuttings from mature stems of grown plants and from sprouts of sweet potatoes, for planting purposes.]** Korte Ber. Landbouwvoorlichtingsd., Dept. Landb., Nijverheid en Handel. (Selectie-en zaadtuin) (Buitenzorg) 19: 1–6. 1919.—Both methods of propagation proved equally good, but the latter was found to be of greater practical value.—*L. Koch.*

894. Piola-Caselli, (E.). **Les associations agricoles pour l'irrigation des terrains d'après le type italien des consorzii. [Agricultural associations for irrigation after the Italian co-operative type.]** Bull. Inst. d'Egypte 1: 71–85. 1919.—A brief résumé of the history of irrigation in Italy is given. The organization of the different kinds of coöperative associations, both public and private, is discussed, and the laws governing them are cited. Finally, the particular suitability to Egyptian conditions of coöperative associations for the development and operation of plants for irrigation by pumping is emphasized.—*Geo. F. Freeman.*

895. Russell, E. J. **The Ithaca agricultural experiment station.** [Rev. of reports for the years 1914–17.] Nature 104: 482–483. 1920.—Summarizes some results of work on soy-bean nodule organism (Mem. Cornell Univ. Agric. Exp. Sta. [Ithaca] Bull. 386), direct assimilation of certain carbohydrates by green plants (*Ibid.* 9), costs of production of farm crops (*Ibid.* Bull. 377), and fertile and infertile soils.—*O. A. Stevens.*

896. Sifton, H. B. **Longevity of the seeds of cereals, clovers and timothy.** Amer. Jour. Bot. 7: 243–251. *5 fig.* 1920.—The longevity of seeds of wheat, oats, timothy, alsike and red clover was studied by storing samples from crops of these plants grown in representative parts of Canada and making a germination test on a small portion of each sample every year. From 17 to 19 such annual tests have been made on each crop. With wheat, there is no decrease in the percentage of germination for five years, and but little for eleven years. From 11 to 15 years, however, there is a very rapid loss of germinative power and then a somewhat slower loss, until after 18 years no seeds at all will grow. In the case of oats, there is a slight increase in germinative power for 7 or 8 years and then a gradual decrease which is much slower than that in wheat. 41 per cent of the seeds were still alive after 19 years. Timothy differs from wheat and oats in that the germinative power begins to fall off at once. After 7 years it drops rapidly and after the 12th year slows up again. Practically all seeds were dead at 17 years. Alsike and red clover show a regular and steady decline from the very first. After 17 years, however, a small proportion of seeds of both were still alive.—*E. W. Sinnott.*

897. Smith, J. Warren. **Effect of snow on winter wheat in Ohio.** Monthly Weather Rev. 47: 701–702. *1 fig.* 1919.—The relation of snow cover to the yield of wheat is not a direct one. Snow in itself, if above the normal late in the year, may be detrimental, but it is of great value during periods of unseasonable temperature by preventing frost-heaving of soil when freezing and thawing conditions prevail.—*E. N. Munns.*

898. Syme, J. E. **Farmers' experiment plots. Winter fodders, Western District, 1919.** Agric. Gaz. New South Wales 31: 315–317. 1920.—Report of trials by six farmers with miscellaneous forage crops for pasture, with records of the carrying capacity.—*C. V. Piper.*

899. Vendrell, Ernesto. **Estudios sobre los abonos verdes en rotación con las demás plantas cultivadas en Cuba. III. [Green manures in rotation with other plants in Cuba. III.]** Revist. Agric. Com. y Trab. 3: 71–74, 112–115. 1920.

900. Vornemann, Prof. Dr. **Die Kohlenstoffernahrung der Kulturpflanzen. [The carbon dioxide assimilation of cultivated plants.]** Mitteil. Deutsch. Landw. Ges. 35: 302–303. 1920.—This is a semi-popular paper setting forth especially the value of the $CO_2$ that is developed in the soil by the decay of organic matter and reaches the surface below the leaves of the growing crop. The practical conclusion is reached, that manure or green manure should be so applied as to produce the maximum decay during the height of the growing season. The value of tillage consists partly in encouraging the evolution of carbon dioxide.—*A. J. Pieters.*

901. Waldron, J. W., A. Gartley, C. R. Hemenway, J. N. S. Williams, G. P. Wilcox, T. H. Petrie, and H. P. Agee. **Report of Committee in Charge of the Experiment Station.** Rept. Exp. Sta. Hawaiian Sugar Planters' Assoc. for 1919. *49 p.* 1920.—Discussion of certain fungus and insect enemies of sugar cane, together with reports as to progress of investigations concerning the fertilizer requirements of cane, refining qualities of commercial sugar, utilization of molasses, sugar-cane breeding work, and methods of cultivation.—*J. M. Westgate.*

902. Wenholz, H. **Broom millet seed as feed for stock.** Agric. Gaz. New South Wales 31: 305–307. 1920.—Broom millet seed of good quality is a comparatively cheap feed for poultry, and, if fed judicially, for horses, sheep, cattle and pigs. The most serious drawback is the difficulty of storage. The three essentials for safe storage are, (1) quick reduction of moisture content, (2) good ventilation and (3) well-cleaned seed free from dirt. Grinding of the seed before feeding is advisable, except for sheep and poultry; soaking improves the feed for pigs.—*C. V. Piper.*

903. Willcox, Sir William. **The Sudd Reservoir or Nature's provision of perennial irrigation and flood protection for the whole of the Nile valley.** Bull. Inst. d'Egypte 1: 35–69. 1919.—The author treats the problem under seven headings, which are discussed in order. The total profitably cultivable area of Egypt is given as 6,663,000 acres of which 1,312,000 acres are uncultivated. Of the area cultivated, 4,064,000 acres are under perennial irrigation (a continuous water supply) and 1,287,000 acres are under basin irrigation (covered with water only once a year when the Nile is in flood). For the whole of Egypt, the water required annually for the irrigation of lands now cultivated amounts to 9,000,000,000 cubic meters. When all of the available land is cultivated, 13,500,000,000 cu. m. will be required. To irrigate 500,000 acres in the Sudan, 3,750,000,000 cu. m. of water will be required annually. Since only 5,500,000,000 cu. m. are naturally available, there will be a deficit of 11,500,000,000 cu. m. The present net capacity of Aswan reservoir is 2,000,000,000 cu. m., leaving 8,500,000,000 cu. m. to be provided by additional works. To furnish additional water, the author recommends that the natural storage in the Sudd region of the White Nile be drawn upon, and describes the various projects necessary to accomplish this. Another storage reservoir could also be formed by the construction of a barrage on the Saubat (Sabat) river at a point above Nassar. This reservoir is designed to furnish the 3,750,000,000 cu. m. of water needed for the Sudan. By raising the Aswan dam, its storage capacity could be increased to 4,000,000,000

cu. m. A regulating barrage on the White Nile and training works on the Rosetta and Damietta branches in lower Egypt would serve to lessen floods. Eight appendices are added as follows: (A) The actual value of the agricultural land of Egypt; (B) Utilization of the ground water of the Nile valley; (C) Flush and lift irrigation; (D) The Aswan dam; (E) Some aspects of the White Nile reservoir; (F) MR. C. E. DEPUIS on the Lake Tsana reservoir; (G) SIR WILLIAM GARSTIN on the Gebel and Zeraf Rivers of the Sudd region; (H) Total estimate of the costs of reservoirs and flood protection for Egypt and the Sudan.—*Geo. F. Freeman.*

## BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

LINCOLN W. RIDDLE, *Editor*

904. ÅKERMAN, Å. **En växtförädlares underbara levnadsöde. Några ord om Aron Aronsohn och hans verksamhet. [A plant breeder's remarkable fate. Some words about Aron Aronsohn and his work.]** Sver. Utsädesf. Tidskr. 29[4]: 165–168. 1919.—A biographical sketch of Aron Aronsohn.—See also Bot. Absts. 6, Entry 1447.

905. ANONYMOUS. **Leonard Cockayne. [Biographical notice.]** With portrait. New Zealand Jour. Sci. Tech. 2: 231–234. July, 1919.

906. ANONYMOUS. **Bulletin Agricole de L'Institute Scientifique de Saigon.** Brooklyn Bot. Gard. Rec. 8: 146. Oct., 1919.—Notes the appearance of the first number of this new publication.—*C. S. Gager.*

907. ANONYMOUS. **The Botanic Garden, Havana.** Kew Bull. Misc. Inf. [London] 1919: 101–102. 1919.

908. ANONYMOUS. **The dahlia.** Missouri Bot. Gard. Bull. 7: 41–46. *Pl. 12–13.* 1919.

909. ANONYMOUS. **How flowers were named.** Sci. Amer. Supplem. 87: 176. 1919.

910. ANONYMOUS. **Necrologia. [Necrology.]** Revist. Agric. Com. y Trab. 2: 476. 1919. —Records the death of PATRICIO CARDÍN, head of the department of Entomology and Vegetable Pathology of the Agronom. Exp. Sta., Cuba.—*F. M. Blodgett.*

911. ANONYMOUS. [Rev. of: Fox, R. HINGSTON. **Dr. John Fothergill and his friends: Chapters in eighteenth century life.** 8°. *xxiv + 434 p., 13 pl.* Macmillan & Co.: New York.] Jour. Botany 58: 56–59. 1920.

912. ARAGÓN, FRANCISCO DE LAS BARRAS DE. **Cartas del botánico francés Léon Dufour a Don Mariano Lagasca, existentes en el Archivo de la Real Academia de Medicina de Sevilla, encontradas y trascritas. [Letters of the French botanist, Léon Dufour to Mariano Lagasca, in the Archives of the Royal Academy of Medicine of Seville, found and transcribed.]** Bol. R. Soc. Española Hist. Nat. 19: 394–400. 1919.—Gives four letters written from St. Sever by LÉON DUFOUR, partly in French partly in Spanish, to MARIANO LAGASCA, Director of the Royal Botanical Garden at Madrid, in 1817 and 1819, mainly relating to specimens being sent to Madrid, also containing notes on interesting trips planned in the Pyrenees; requests for specimens and notes on certain species, particularly lichens; comments on the appearance of new botanical literature; discussion as to whether a certain epidemic in Cadiz might be yellow fever. There is also a letter, in Spanish, from MARIA TADEA GONZALEZ to LAGASCA relating the forwarding to LAGASCA of books and botanical and entomological specimens which had been accumulated by LORENTE. The author of the article notes that DUFOUR had gone to Spain as a member of Napoleon's army, and had formed a friendship with VICENTE ALFONSO LORENTE at Valencia. Because of sympathy for him as a fellow botanist, DUFOUR had probably saved LORENTE from execution for the prominent part he had played in the defense of

the city. Most of the books and specimens left with Lorente by Dufour were finally forwarded to Lagasca at Madrid.—*O. E. Jennings.*

913. Arnaud, G. **Rapport sur le fonctionnement de la société depuis sa fondation jusqu'à la fin de 1919. [Review of the acts of the society from its foundation to the close of 1919.]** Bull. Soc. Pathol. Vég. France [Paris] **6:** 154–158. Nov.–Dec., 1919.—A brief summary of the history of the French Plant Pathological Society, which was established February 11, 1914, through the efforts of Professor Mangin. The work of the society was greatly interrupted by the war. It is now renewing its activity and increasing its membership, which is 104. It is noted that two members have been elected to the National Academy of Science and two others elected deputies.—*C. L. Shear.*

914. Bardie, A. **Quelques notes sur la Physalis Alkekengi dans la Gironde. [Notes concerning Physalis Alkekengi L.]** Actes Soc. Linn. Bordeaux (Procès-verbaux) **69:** 39–47. 1915–16. [Received May, 1920.]—After a brief description of the habitat of this species of *Physalis*, the author gives detailed information regarding the reputed pharmaceutical properties of the plant since the time of the ancient Greeks.—*W. H. Emig.*

915. Beringer, G. M. **Frank G. Ryan, memoir with portrait.** Amer. Jour. Pharm. **92:** 371–376. 1920.

916. Blakeslee, A. F., Roland Thaxter, and William Trelease. **William Gilson Farlow, December 17, 1844–June 3, 1919.** Amer. Jour. Bot. **7:** 173–181. *1 pl.* 1920.—The authors present a brief biographical sketch of Professor Farlow, which is followed by a list of his publications. [See also Bot. Absts. 6, Entries 947, 956, 963, 1463, and 1470.—*E. W. Sinnott.*

917. Bouchard, Georges. **Le grand naturaliste Canadien. [The great Canadian naturalist.]** Naturaliste Canadien **45:** 114–115. Feb., 1919.—An appreciation of the late L'Abbé L. Provancher, naturalist and founder of Le Naturaliste Canadien.—*A. H. MacKay.*

918. Briquet, J. **Les collections botaniques du botaniste espagnol José Quer. [The collections of the Spanish botanist José Quer.]** Annuaire Conservatoire et Jard. Bot. Genève **20:** 465–478. *4 fig.* 1919.—Quer was born at Perpignan, Jan. 26, 1695, and died at Madrid, Mar. 19, 1764. He collected in southern Europe and northern Africa and projected a flora of Spain. The first four volumes appeared from 1762 to 1764, but the fifth and sixth, in collaboration with Gomez de Ortega, not until 1784. Figure 1 is a portrait of Quer. There is a description of his herbarium now at the Delessert Herbarium.—*A. S. Hitchcock.*

919. Britten, James. **In memory of Edward Shearburn Marshall, 1859–1919.** Jour. Botany **58:** 1–11. 1920.—Marshall was born March 7, 1858, and died Nov. 25, 1919. He received his university education at Oxford, and became a clergyman by profession.—It was probably while at Oxford that he became interested in plants. His first contribution to the Jour. Botany, of which he was later a leading supporter, was in 1885. Subsequently he became a prominent British botanist of keen critical judgment, more inclined perhaps to see differences than relationship and somewhat prone to over-confidence, but sound in the end. Though having a wide interest in flowering plants, he studied more especially *Saxifraga*, *Hieracium*, *Rubus*, *Euphrasia*, *Eriophila*, *Viola*, *Epilobium*, *Salicornia*, and *Carex*. Marshall was strongly opposed to the "lumping school" of taxonomists and resented the tossing aside by Bentham, Hooker and others as worthless critical field observation made by careful workers. His own work was usually based on abundant material. His name is associated with two plants, *Hieracium Marshallii* Linton and *Rubus Marshallii* Focke & Rogers. He published a Flora of Kent in 1889 and contributed the article on *Betula* to the Cambridge British Flora in 1914. He also published a supplement to the Flora of Somerset. Marshall had a wide acquaintance among British botanists and was a delightful companion. In 1911 he was elected an Honorary Fellow of the Botanical Society of Edinburgh. He was a vigorous collector, satisfied only with

the best of specimens, and using great care in their preparation. He was a careful writer, with a clear concise style, and exceedingly methodical.—*K. M. Wiegand.*

920. Britton, Elizabeth G., and others. **Resolutions upon the loss of the collections and library of M. Jules Cardot.** Bryologist 22: 87–88. 1919.

921. Church, A. H. **Brunfels and Fuchs.** Jour. Botany 57: 233–244. 1919.—Stimulated by the proposed issue of a second volume of the Cambridge British Flora, the writer queries whether the figures in the first volume were as nearly ideal as they might be. He is led to consider the work of Leonard Fuchs, "De Historia Stirpium," published in 1542. He pronounces this "the original standard for all subsequent volumes of illustrations of plants." Fuchs was a leading physician and professor, and a wealthy man. He employed several artists of note, and perhaps the best engraver of Strasburg, Vitus Rudolph Speckle. The volume comprises 519 folio drawings, with associated text, of plants growing in southern Germany. The first plates were rather crude, and some were copied. The later ones show a great advance both in drawing and engraving, and are elegant examples of the engraver's art. They compare most favorably with the best work done in modern times. The artists were probably designers, and were not botanists. They were little impressed by fine detail of structure, and were best at the artistic arrangement of large parts. The writer points out that Fuchs really built upon his predecessor, Otto Brunfels, whose volume stands as the first recognized work on scientific botany of the new era. Brunfels' illustrations, though not so numerous nor so elaborate as those of Fuchs were far more accurate as to detail. Brunfels was a poor man and probably made the drawings himself. Some of these were very poorly copied by Fuchs' illustrators in their early drawings. Brunfels was much ahead of his time in presenting detail, which he faithfully drew but did not understand. The writer cites many illustrations from both Fuchs and Brunfels to make clear the points in his argument. "The work of Brunfels and Fuchs covers the whole province of the fundamentals of botanical illustration." "The addition of special botanical details, as accurate drawings, or neat combination in a diagram of established convention, is again exemplified by Fuchs; while the clearness of line-reproduction expressed in the work of Speckle puts to shame modern methods of line process-work." The illustrations in Gerard and Parkinson are considered to have degenerated from the standards set by Brunfels and Fuchs.—*K. M. Wiegand.*

922. Cook, Mel T. **Byron David Halsted.** Bot. Gaz. 67: 169–170. *1 fig.* Feb., 1919.—A biographical sketch with portrait.

923. Demorlaine, J. **La nécessité d'un service forestier d'armée sous l'ancien régime. [The need for an army forest service.]** Rev. Eaux et Forêts 57: 229–230. 1919.—See Bot. Absts. 5, Entry 179.

924. [Dodge, B. O.] **Index to American mycological literature.** Mycologia 12: 112–114. 1920.

925. Doidge, Ethel M. **The rôle of bacteria in plant diseases.** [Presidential address, South African Assoc. Adv. Sci. Kingwilliamstown, July, 1919.] South African Jour. Sci. 16: 65–92. 1919.—See Bot. Absts. 5, Entry 2031.

926. Fitting, Hans. **Zur Jahrhundertfeier der Bonner Universität. Die Entwicklung der Naturwissenschaften an der Bonner Universität seit ihre Begrundung. Botanik. [The development of botany during the past century at the University of Bonn.]** Naturwissenschaften 7: 571–576. 1919.—This is a historical survey. Nees von Esenbeck, Sachs, Pfeffer, Hansteen, and Strasburger are among those who contributed to the prestige of botany at Bonn.—*Orton L. Clark.*

927. François, L. **Notice sur Achille Müntz.** Rev. Gén. Bot. 32: 5–14. *Portrait.* 1920.—An account of the researches of A. Müntz (1846–1917), which included investigations

of the sugars found in fungi and their relation to respiration; nitrification in the soil through the agency of living organisms; organized and soluble ferments; the rôle of ammonia in the nutrition of higher plants; the effect of light on assimilation; the relation of the composition of forage plants to the formation of milk sugar by animals; and the chemical changes occurring in the ripening of starchy and oleaginous seeds.—*L. W. Sharp.*

928. Fyson, P. F. **Editorial.** Jour. Indian Bot. 1: 1–2. Sept., 1919.—The *Journal of Indian Botany* has been started to provide a means of publishing botanical work done in India, which would not naturally find a home in existing botanical journals of that country, especially in branches other than floristic and agricultural botany. To be issued monthly, and to contain original matter and abstracts.—*C. S. Gager.*

929. Gershenfeld, Louis. **Galen, a sketch.** Jour. Amer. Pharm. Assoc. 9: 520–522. 1920.

930. Goebel, K. **Ernst Stahl zum Gedächtnis. [In memory of Ernst Stahl.]** Naturwissenschaften 8: 141–146. 1920.

931. Groves, James. **Cornelius Varley, 1781–1873.** Jour. Botany 58: 50–53. 1920. Varley's mother was probably a direct descendant from Oliver Cromwell. The immediate family showed strong artistic tendencies. Cornelius, unlike his brother, developed also a marked ability as an instrument maker, especially of optical instruments. The main reason for considering him as a botanist lies in his remarkable paper on *Chara* published in 1849 ("on *Chara vulgaris*," Trans. Microsc. Soc. 2: 93–104. 1849) before Alexander Braun's work appeared. In this he saw clearly many of the details of cellular construction that were later brought out by Braun.—*K. M. Wiegand.*

932. Guthrie, John D. **Early English forest regulations.** Jour. Forestry 18: 530–541. 1920.—Presents English forest customs and usages dating back to the 14th century. The personnel of a forest, its administration, grazing uses and silviculture are described.—*E. N. Munns.*

933. Holmes, E. M. **The manna of scripture.** Chem. and Druggist 92: 25–26. 1920.—The manna of Moses has been ascribed to various bushes or small trees, such as *Tamarix gallica*, var. *mannifera*, yielding saccharine exudations, of some value as food, for sweetening cakes, etc. It has also been supposed that it was of fungous origin, or a lichen,—perhaps *Lecanora esculenta*, var. *mannifera*. Swann, in his recent book "Fighting the slavedriver in central Africa," writes as follows (p. 116): "It was whilst passing through this district (the high plateau which separates Lakes Nyasa and Tanganyika), composed mostly of sandstone and granite, and occupied by the Amambwi tribe, that I was shown a very curious white substance very similar to porridge. It was found early in the morning before the sun rose. On examination it was found to possess all the characteristics of the manna . . . . of the Israelites. In appearance it resembled coriander seed, was white in color like hoar frost, sweet to the taste, melted in the sun and if kept over night was full of worms in the morning. It required to be baked if you intended to keep it for any length of time. It looked as if it were deposited on the ground in the night. The only suggestion I could think of was that it might be a mushroom spawn, as on the spot where it melted, tiny fungi sprung up the next night." Dr. Woreham, a medical missionary of this African district, confirms Swann's statements but says that this "manna" is of rare occurrence.—Because of the Great Rift valley, which extends from the Lebanons to the Cape of Good Hope and is evidently the bed of a formerly great river, it is fully possible for a cryptogamic plant to be found in widely separated locations in this valley where the conditions are suitable for its development. A possibility of identifying the manna of Scripture lies here, and an effort is being made to secure preserved specimens and samples of the soil where they are obtained.—*E. N. Gathercoal.*

934. Howard, L. O. **Recollections of the early days of the Biological Society.** Proc. Biol. Soc. Washington [D. C.] 32: 271–280. 1919.—Reminiscences and anecdotes of the Biological Society of Washington are related.—*J. C. Gilman.*

935. Huard, V.-A. **Le Naturaliste Canadien.** **[The Canadian Naturalist.]** Naturaliste Canadien 45: 97–101. Jan., 1919.—An appeal to subscribers. Founded in 1868 by L'Abbé Provancher, the only French scientific periodical published by Canadian French, or in America, or possibly in any country outside France.—*A. H. MacKay.*

936. Huard, V.-A. **L'abbé Provancher.** [Continued from Naturaliste Canadien 45: 17–18. 1918.] Naturaliste Canadien 45: 134–138. 1919.—A biographical sketch with special reference to the history of Le Naturaliste Canadien. [To be continued.]—*A. H. MacKay.*

937. Jackson, B. Daydon. **Pritzel's "Index."** Jour. Roy. Hortic. Soc. 45: 14–21. 1919.—A sketch of the life of Georg August Pritzel, together with an outline of a project to publish, under the auspices of the Royal Horticultural Society, a revision of his "Iconum Botanicarum Index Locupletissimus," completed in 1865 and now out of print. There is no printed record of the many excellent figures published during the last 53 years. The original Pritzel contained about 107,000 entries, and it is estimated that the new edition will include at least 125,000 additional entries. All botanical plates are to be cited under the names employed by those responsible for the plates. The pictures printed in such horticultural journals as Gardeners' Chronicle, the Garden, and their foreign equivalents, are to be quoted.—*J. K. Shaw.*

938. Kraemer, Henry. **Life and work of Charles Tanret.** Amer. Jour. Pharm. 91: 265–270. 1919.—An account of the life activities of Charles Tanret, the French pharmacist, who died July 29, 1917. The author reviews Tanret's scientific achievements, including his studies on the active principles of ergot and pomegranate bark and the detection of albumin, peptones and alkaloids.—*Anton Hogstad, Jr.*

939. Kremers, Edward. **Professor Alexander Tschirch.** [Sketch with portrait.] Jour. Amer. Pharm Assoc. 9: 359–360. 1920.

940. Leopold, Aldo. **Forestry of the prophets.** Jour. Forestry 18: 412–419. 1920.—Excerpts from the Old Testament showing that some of the Jewish prophets had considerable knowledge of forests, and forest products.—*E. N. Munns.*

941. Lister, G. **Mycetozoa from Cornwall.** Jour. Botany 58: 127–130. 1920.—See Bot. Absts. 6, Entry 791.

942. Maheux, George. **La protection des plants chez les Romains.** **[The protection of plants among the Romans.]** Naturaliste Canadien 45: 146–157. 1919.—The author refers to Theophrastus' "History of plants," Varro's "*De re rustica,*" Cato the Elder's "Treatise on agriculture," Virgil's "Georgics," Pliny the Elder's "Natural history," Columella's "Treatise on agriculture," and Palladius' works on the same subject; also to the "Voyage agricole chez les anciens," published in 1898 by l'abbé Beauredon. The subject is treated under three general subdivisions, cereals, legumes, and fruit trees.—*A. H. MacKay.*

943. Marshall, T. Dabney. **The work of an Alabama plant wizard.** Flower Grower 6: 97. 1919.—The work of L. H. Read, of Deer Park, Alabama, is briefly described.—*W. N. Clute.*

944. Martin, George W. **An early American record of mushroom poisoning.** Mycologia 12: 53–54. 1920.—Author presents a unique inscription on a tombstone dated 1695, which tells of two boys who died as a result of eating mushrooms.—*H. R. Rosen.*

945. Mattirolo, Oreste. **Sul pregiudizio, che i fichi secchi e le castagne secche o crude facciano sviluppare e crescere i pidocchi sul capo di chi li mangia. [Concerning the superstitious belief that dried figs and dried or raw chestnuts produce lice on the heads of those who eat these fruits.]** Nuovo Gior. Bot. Italiano 26: 46–57. 1919.—Many people believe that the eating of figs and chestnuts causes the development of lice. This superstition is traceable to

the fact that members of the Acari are both plant and animal parasites. The eating of these minute insects together with the fruits neither affects the digestion nor does it engender lice on the heads of those who eat them.—*Ernst Artschwager.*

946. Montemartini, Luigi. **Rodolfo Farneti.** Revist. Pathol. Veg. 9: 121–125. 1919.—Rodolfo Farneti, "libero docente" of vegetable pathology in the Royal University of Pavia, died Jan. 18, 1919. While his field of observation was broad, he specialized along the lines of mycology and phytopathology. A list of his published work in these lines is given, with some comments.—*F. M. Blodgett.*

947. Murrill, W. A. **Dr. William Gilson Farlow.** Mycologia 11: 318. 1919.—A brief account of Dr. Farlow's life.—See also Bot. Absts. 6, Entries 916, 956, 963, 1463, and 1470.—*H. R. Rosen.*

948. Murrill, W. A. **Pier Andrea Saccardo.** Mycologia 12: 164. 1920.—A brief account of Saccardo's life.—*H. R. Rosen.*

949. Parish, S. B. **A supplementary bibliography of the southern California flora.** Bull. Southern California Acad. Sci. 19: 24–29. 1920.—The author completes to date a bibliography begun in the same journal (volumes 8 and 9). Southern California is understood to have as its northern limit Santa Barbara, Ventura, Kern, and Inyo counties.—*Roxana S. Ferris.*

950. Paterno, E. **Origini e sviluppo della crioscopia. [Origin and development of cryoscopy.]** Gaz. Chim. Italiana 49: 381–411. 1919.—See Bot. Absts. 5, Entry 2144.

951. Paul, David. **On the earlier study of fungi in Britain.** Trans. British Mycol. Soc. 6: 91–103. 1918.—See Bot. Absts. 4, Entry 1142.

952. Pearson, Wm. Hy. **William Hobson.** Bryologist 23: 36–37. 1920.—A brief note concerning the life and work of the brothers Edward and William Hobson with a request for further information about the latter.—*E. B. Chamberlain.*

953. Plitt, Charles C. **A short history of lichenology.** Bryologist 22: 77–85. 1919.—The author outlines the ideas current concerning lichens from the Greeks to the time of Linnaeus with some mention of the ancient uses of the plants. The development of systematic study after Linnaeus is sketched. Attention is given to historical views of the nature of lichens as plants, to the ideas concerning gonidia, sexuality, and to present-day views.—*Edward B. Chamberlain.*

954. Praeger, R. Ll. **Nathaniel Colgan.** Irish Nat. 28: 121–126. 1919.—Obituary notice of an amateur naturalist chiefly interested in botany. He edited the new edition of "Cybele Hibernica" (1898) and was author of "Flora of the County of Dublin" (1904). Portrait and list of publications.—*W. E. Praeger.*

955. Prain, D. **J. W. H. Trail, M.D., F.R.S.** Jour. Botany 57: 318–321. 1919.—James William Helenus Trail was born in Birsay, Scotland, March 4, 1851. His love of natural history was early apparent. Trail graduated from the University of Aberdeen in 1870, with honors, and then entered the faculty of medicine, not through interest in medicine but in order to obtain a further training in science. Here his record was also brilliant, but he laid the study of medicine quickly aside when the opportunity came to travel in the Amazon region. Following his return his observations were written up and published; and at the same time he completed his study in medicine. His accurate work suggested his appointment as government botanist in British Guiana, but the retirement of Professor Dickie, of Aberdeen, led to Trail's appointment in his place, and thus prevented the acceptance of the position in Guiana. At the age of 26 he took up the work at Aberdeen, which he continued until his recent death, forty-two sessions in all. Trail was not a fluent speaker, but a con-

vincing teacher. His skill in selecting matter and accuracy in presenting this to students made his classes models of pedagogy. As a leader of field-excursions he could have no superior. A well-equipped laboratory has been built up through his efforts. He was elected Fellow of the Linnaean Society in 1875, Fellow of the Royal Society in 1893, and president of the British Association in 1910. A capacity for business led to his being much in demand in connection with University affairs. After 1892 he was dean of the new faculty of science. Many other activities drew upon his time. He left endowment funds for the support of various local interests. These acts of generosity, however, represent but a small part of TRAIL's thoughtful and unobtrusive benevolence. The range of his knowledge and its accuracy were phenomenal. His sincerity and kindness, as well as his scholarship, compelled regard and esteem.—*K. M. Wiegand.*

956. RIDDLE, L. W. **William Gilson Farlow.** Rhodora 22: 1-8. *Portrait.* 1920.—A biographic sketch of the late WILLIAM GILSON FARLOW, Professor of Cryptogamic Botany in Harvard University from 1879 to 1919. [See also Bot. Absts. 6, Entries 916, 947, 963, 1463, and 1470.]—*James P. Poole.*

957. RIVIERE, C. **Le jardin d'essai d'Alger.** [**The experimental garden of Algiers.**] Rev. Hortic. [Paris] 91: 340-342. Sept., 1919.—This historical note on the founding and establishing of the experimental garden supplements, by adding numerous details, a previous discussion on the same topic (Rev. Hortic., June, 1919).—*E. J. Kraus.*

958. ROTH, FILIBERT. **Great teacher of forestry retires.** Amer. Forestry 26: 209-212. *1 portrait.* 1920.—An appreciation of PROFESSOR EMERITUS B. E. FERNOW, pioneer in forestry teaching and education.—*Chas. H. Otis.*

959. SMALL, JAMES. **The application of botany in the utilization of medicinal plants.** Pharm. Jour. 103: 199-201, 213-215, 248-250, 294-296. 1919.—A review is given of the botanical materia medica of Palaeolithic man, Neolithic man, the early Hindus, Chinese, Egyptians, Persians, Druids, Greeks, Romans and aboriginal Americans. Mention is made of the Chinese knowledge of Rhubarb as a purge in 2700 B. C., of the two kinds of Indian Hemp plants in 1200 B. C., and of the Chinese Royal Botanical Garden of 111 B. C.; also of the outstanding fact in all of this early materia medica of the prominent use of narcotics and stimulants with the probability that the use of Opium was known to Paleolithic man. The adoption by Western Europe of foreign drugs brought back by early explorers and especially through medical and botanical exploration is noted.—The introduction of medicinal plants into medical practice is described under the headings: Discovery, Recommendation, Experimentation, Secret Remedy Stage, Permanent exploitation. Under Permanent exploitation, reference is made to the full botanical description of the plant, its cultivation, the determination of its active principles and its economic production. In the chapter entitled Present applications, reference is made to present-day medical and botanical exploration under the auspices of national governments, scientific societies and manufacturing firms. Botanical gardens and drug farms, investigations in microscopic pharmacognosy, phytochemistry, ecology and genetics are discussed.—The last chapter is on Future applications, discussed under the headings: Discovery, Experimentation, Suggested organization and Suggested researches. Among the many suggestions made by the author are the following: (1) A [British] pharmaceutical research committee, with 25 per cent of its membership eminent botanists, who would have the influence necessary to secure facilities for work on medicinal plants in university and other institutions where the experimental plant-growing and plant-breeding would be under expert botanical control. (2) A quarterly journal or bulletin issued by this committee, to contain not only abstracts of completed researches, but some account of the progress of unfinished work.—Many examples and illustrations are introduced and scores of plant names are mentioned.—*E. N. Gathercoal.*

960. SMITH, ANNIE MORRILL. **Obituary** [of MISS LURA L. PERRINE]. Bryologist 23: 3. 1920.—A notice of Miss Perrine's life and work.—*E. B. Chamberlain.*

961. STONE, R. E. **Meeting of the Canadian Branch of the American Phytopathological Society.** Mycologia 12: 43–45. 1920.—See Bot. Absts. 4, Entry 1366.

962. SWINGLE, WALTER T. **More about Loureiro.** Amer. Bot. 26: 28. 1920.—Additions and corrections for a longer article, which appeared in same journal, Nov., 1919.—*W. N. Clute.*

963. [VINES, S. H.] **William Gilson Farlow.** Ann. Botany 33: 15–16. 1919.—See also Bot. Absts. 6, Entries 916, 947, 956, 1463, and 1470.

964. WRIGHT, I. A. **The history of the cane sugar industry in the West Indies.** Louisiana Planter and Sugar Manufacturer 62: 414–415. Ibid. 63: 14–15, 108–109, 222–223, 237–239, 414–415. 1919.—The history is written from documents, mostly unpublished, that exist in the archives of the Indies, Seville, Spain. The development of the industry is traced from the first part of the sixteenth century.—*C. W. Edgerton.*

## BOTANICAL EDUCATION

C. STUART GAGER, *Editor*
ALFRED GUNDERSEN, *Assistant Editor*

965. ANONYMOUS. **The annual meeting, Science Masters' Association. Biology in the school science course.** School Sci. Rev. [London] 1: 79–84. 1919.—Brief discussions by a number of teachers.

966. ANONYMOUS. **Descriptive guide to the grounds, buildings and collections** [New York Bot. Gard.]. Bull. New York Bot. Gard. 10: 89–212. *Pl. 199–226. 1 map.* 1920.

967. ANONYMOUS. **Naturschutz. [Preservation of natural sites.]** Forstwiss. Centralbl. 41: 333–336. 1919.—See Bot. Absts. 6, Entry 1015.

968. ANONYMOUS. **A great artist of nature.** [Rev. of: THORBURN, ARCHIBALD. **A naturalist's sketch book.** Longmans, Green and Co.: London, 1919.] Nature 104: 432–433. 1920. —"This century has produced two great artists of nature—namely, JOSEPH WOLF and ARCHIBALD THORBURN." The volume contains 60 plates, chiefly of birds and other animals, but also some of plant life.—*O. A. Stevens.*

969. ANONYMOUS. [Rev. of: DUNCAN, F. MARTIN. **Insect pests and plant diseases in the vegetable and fruit garden.**] Nature 104: 467. 1920.

970. ANONYMOUS. **The study of the familiar.** [Rev. of: DOWNING, E. R. **A source book of biological nature-study.**] Nature 104: 465–466. 1920.

971. BRITTON, N. L. **Report of the Secretary and Director-in-Chief** [New York Bot. Gard.] **for the year 1919.** Bull. New York Bot. Gard. 10: 213–306. 1920.—Contains a general report and special reports of assistants, curators, etc., as well as the financial reports.—*E. A. Bessey.*

972. DURRANT, R. G. **Ions in solution.** School Sci. Rev. [London] 1: 7–11. 1919.—ARRHENIUS recently said ionic dissociation theory holds field against all others. Its importance is such that reference to it should be made in regular elementary laboratory work.—*A. Gundersen.*

973. EVANS, E. PRICE. **Local ecology as a basis of school botany.** School. Sci. Rev. [London] 1: 113–122. June, 1919.—The physiographic ecology of a region near Durham, England, is presented as a possible basis for the botany courses of the secondary schools. The region affords many different types of vegetation. The presentation of the subject is somewhat advanced.—*Norman Taylor.*

974. Owen, J. H. **School natural history societies. I. Felsted School Scientific Society.** School Sci. Rev. [London] 1: 42–44. 1919.—This society was founded in 1877 and has sections in botany, geology, ornithology and other subjects.—*A. Gundersen.*

975. Whitney, W. **Science of plant life.** [Rev. of: Transeau, E. N. **Science of plant life.** *336 p., 194 fig.* World Book Co.: Yonkers-on-Hudson, New York, 1919.] Plant World 22: 248–249. 1919.

## CYTOLOGY

Gilbert M. Smith, *Editor*
G. S. Bryan, *Assistant Editor*

976. Adams, J. F. **Sexual fusions and development of the sexual organs in the Peridermiums.** Pennsylvania Agric. Exp. Sta. Bull. 160: 31–76. *5 pl.* (1919.) 1920.— See Bot. Absts. 6, Entry 1214.

977. Allen, Charles E. **The basis of sex inheritance in Sphaerocarpos.** Proc. Amer. Phil. Soc. 58: 289–316. *28 fig.* 1919.—Plants of *Sphaerocarpos Donnellii* were successfully cultivated under greenhouse conditions in pots kept in a Wardian case. Although modifications in the form of the thallus occur when plants are grown under cultivation, the changes brought about by environmental conditions do not bring about any loss of function on the part of the sex organs or of the gametes. Fertilization was easily secured and sporophytes were formed in abundance. Spores of *S. Donnellii* invariably remained united in tetrads. The differences which distinguish female from male plants result from differences in the spores that are to give rise to them. Of the spores formed by the division of a single mother cell, two bear female potentialities and two male potentialities. There was found to be no marked difference between female producing and male producing spores in their capacity for germination, but a difference in the rate of germination was noted. Cells of the female gametophyte gave eight chromosomes, of which one is much longer and thicker than any of the others; the remaining seven differ in length among themselves. Seven of the chromosomes of the male also vary in length among themselves and seem to correspond to the seven smaller ones of the female; the eighth chromosome of the male is very small. Of the four nuclei formed in the spore mother cell, two sister nuclei and spores receive a large chromosome each. Since the large chromosome is always present in the cells of the female and never in those of the male, a spore receiving a large chromosome necessarily develops into a female gametophyte; a spore réceiving a small chromosome develops into a male gametophyte. The sex chromosomes of *Sphaerocarpos* are compared to the X and Y chromosomes of animals, the female possessing in this case an X element, and the male a Y element. The size differences between plants of opposite sex are determined by the difference in chromosome bulk which influences the rate of cell growth and cell division. A second category of sex characters results from other, still unknown, specific peculiarities of the sex chromosomes. [See also Bot. Absts. 4, Entry 486.]—*Wanda Weniger.*

978. Bezssonoff. **Sur l'obtention expérimentale de la sexualité chez les champignons et orientée sur la structure typique du plasma sexuel. [On the initiation of sexual reproduction in fungi by experimental means, and the existence of a cytoplasmic structure peculiar to the sexual process.]** Compt. Rend. Acad. Sci. Paris 170: 288–290. 1920.—See Bot. Absts. 6, Entry 1344.

979. Bryan, Geo. S. **The fusion of the ventral canal cell and egg in Sphagnum subsecundum.** Amer. Jour. Bot. 7: 223–230. *2 pl.* 1920.—Author reviews briefly the literature dealing with the archegonium of *Sphagnum*, with special reference to the egg and the ventral canal cell. The ventral canal cell regularly persists and is very variable in size. Its protoplast and that of the egg round off and the wall between them disintegrates, the two cells thus lying side by side in the venter of the archegonium. In a number of cases, in material

collected in December, a fusion was discovered not only between these two protoplasts but also between their nuclei. The behavior of the chromatin could not be clearly seen, but the chromatic material from the two nuclei seemed to be more or less intermingled. Cases were found where the ventral canal cell had disintegrated; in other instances the egg had disintegrated and the ventral canal cell remained functional.—*E. W. Sinnott.*

980. Carter, Nellie. **Studies on the chloroplastids of Desmids III. X. The chloroplasts of Cosmarim.** Ann. Botany 34: 265–286. 1920.—See Bot. Absts. 6, Entry 1191.

981. Conklin, E. G. **The mechanism of evolution.** Sci. Monthly 10: 496–515. 1920.—See Bot. Absts. 5, Entry 1987.

982. Dangeard, Pierre. **Sur l'évolution du système vacuolaire chez les Gymnospermes. [The development of the vacuoles in Gymnosperms.]** Compt. Rend. Acad. Sci. Paris 170: 474–477. *8 fig.* 1920.—*Larix europea, Taxus baccata,* and *Gingko biloba* were studied in living condition by means of intravital stains. Vacuomes, spheromes and plastidomes may be found in the same living cell. An especial study is made of the vacuome in which metachromatin exists in young cells as grains which enlarge and fuse into a network which may be spread throughout the cytoplasm. From this network are later formed the vacuoles.—*C. H. and W. K. Farr.*

983. Dangeard, P.-A. **Plastidome, vacuome et sphérome dans Selaginella Kraussiana. [Plastidomes, vacuomes and spheromes of Selaginella Kraussiana.]** Compt. Rend. Acad. Sci. Paris 170: 301–306. *1 pl.* 1920.—The author, as in earlier writings, distinguishes three types of structures which are usually referred to as mitochondria or chondriosomes: namely, plastidomes, vacuomes and spheromes. All are stained black by iron haematoxylin. *Selaginella* affords excellent material for the study because of the few large chloroplasts. The chloroplast arises from a small band lying appressed to the nuclear membrane, which stains deeply with iron haematoxylin and divides just prior to cell-division. Successive divisions of this band, which is called the "mitoplast," give rise to several chloroplasts. Mitoplasts are found in meristematic tissue, young leaves, cortex of the stem, vascular tissue, root tips, and in the primordia of sporangia.—In the vacuoles are metachromatic corpuscles which compose the vacuome. They react to the Regaud stain in the same way as do the mitoplasts. As the vacuoles fuse in the maturing of the cells the vacuomes may remain single or group themselves into chains or ribbons. They, however, always remain within the vacuole though the vacuolar membrane may not, in some instances, be readily distinguishable.—The spheromes are composed of ordinary microsomes isolated or associated in pairs or even chains. They are never enclosed within a vacuole.—The cytoplasm of old cells is differentiated into fibrils along which the microsomes migrate. These fibrils may, therefore, appear to be of the nature of mitochrondria and have been referred to erroneously as chondrioconts. The author is in favor of discarding the terms mitochondria, chondriosomes, chondrioconts, and chondriomites, and substituting the terms vacuomes (metachromes and metachromatic corpuscles), plastidomes (mitoplasts and plastids), spheromes (microsomes) and fibrils of the cytoplasm, which he considers have more precise significance.—*C. H. and W. K. Farr.*

984. Emberger, L. **Évolution du chrondriome chez les cryptogames vasculaires. [The development of chondriosomes in vascular cryptogams.]** Compt. Rend. Acad. Sci. Paris 170: 282–284. *5 fig.* 1920.—Two types of mitochondria are found in the root of *Athyrium Filix-femina,* which differ slightly in the intensity of their staining reaction and in their size. One gives rise to plastids, the function of the other is unknown. The author prefers to apply the term mitochondria to the plastid-forming bodies as well as to those structures whose function is at present unknown.—*C. H. and W. K. Farr.*

985. Emberger, L. **Évolution du chrondriome dans la formation du sporange chez les fougères. [The history of the chondriosome during the formation of the sporangium of the ferns.]** Compt. Rend. Acad. Sci. Paris 170: 469–471. *7 fig.* 1920.—In young sporangia of

*Scolopendrium vulgare*, and *Asplenium Ruta-muraria* are found lenticular and rod-shaped chloroplasts, chondriocontes and granular mitochondria. In the spore mother-cells the chloroplasts undergo transformation into chondriocontes which stain more deeply in later stages. Chondriomites are also present at this stage. The chondriocontes dissociate into mitochondrial granules before the reduction division begins, which persist throughout these divisions as granular chondriosomes. In the spore they give rise to chloroplasts and mitochondrial bodies of various forms. There thus occurs during spore-formation a mitochondrial reversibility.—*C. H. and W. K. Farr.*

986. Evans, Arthur T. **Embryo sac and embryo of Pentstemon secundiflorus.** Bot. Gaz. 67: 427–437. *1 pl.* 1919.—See Bot. Absts. 4, Entry 996.

987. Falqui, G. **Il processo di fecondazione nella Thelisia planifolia (Mill) Mattei. [Fertilization in Thelisia planifolia (Mill) Mattei.]** Nuovo Gior. Bot. Italiano 26: 221–234. 1919. —Observations show that *Thelisia planifolia* is malacophilous and reproduces asexually by means of bubils, which germinate in the fall and give rise to new plants.—*Ernst Artschwager.*

988. Foster, Nathan. **Colloids and living phenomena.** Sci. Monthly 9: 465–473. *9 fig.* 1919.—See Bot. Absts. 4, Entry 1396.

989. Gard, Médéric. **Division chez Euglena limosa Gard. [The cell-division of Euglena limosa Gard.]** Compt. Rend. Acad. Sci. Paris 170: 291–292. 1920. Cytokinesis in this species is by internal cell-division rather than by a simple longitudinal splitting. The 4, 8, 16 or even 32 daughter cells remain as irregular masses within the membrane of the old mother cell. They may be arranged in either one or two planes, and each contain a nucleus, a primitive chloroplast, some pyrenoids, and much starch.—*C. H. and W. K. Farr.*

990. Graham, Margaret. **Centrosomes in fertilization stages of Preissia quadrata (Scop.) Nees.** Ann. Botany 32: 415–420. *Pl. 10.* 1918.—See Bot. Absts. 4, Entry 1037.

991. Guilliermond, A. **Sur les éléments figurés du cytoplasme. [The structural elements of the cytoplasm.]** Compt. Rend. Acad. Sci. Paris 170: 612–615. *5 fig.* 1920. Bodies of mitochondrial form are described in the leaves of *Iris germanica*. These bodies swell, anastomose and form a network which finally becomes transformed into vacuoles. The author disagrees with Dangeard, contending that these bodies are not metachromatic in nature and that they differ in their development and in their microchemical reactions from the chondriosomes of animals. However, there are two types of mitochondria in *Iris germanica;* chondriocontes which assimilate starch in young leaves and later form plastids, and mitochondria of a non-assimilating nature. Besides these bodies there are small globules, probably lipoid in nature, which have nothing in common with chondriosomes.—*C. H. and W. K. Farr.*

992. Guilliermond, A. **Sur l'évolution du chondriome dans la cellule végétale. [The evolution of the chondriome in the vegetable cell.]** Compt. Rend. Acad. Sci. Paris 170: 194–197. *4 fig.* 1920.—In the study of the root of pumpkin (*Cucurbita pepo*) it is found that the chondriocontes produce composite grains of starch. The granular mitochondria in the same cells do not seem to perform this function although they appear to be morphologically and microchemically identical. A similar physiological differentiation occurs in the perianth of the tulip. In the white variety of tulips (*Tulipa* sp.) the chondriocontes stain more heavily than the granular mitochondria. In the yellow varieties the chondriocontes produce xanthophyll.—*C. H. and W. K. Farr.*

993. Hegner, Robert W. **The relations between nuclear number, chromatin mass, cytoplasmic mass and shell characteristics in four species of the genus Arcella.** Jour. Exp. Zoöl. 30: 1–95. *47 fig.* Jan. 5, 1920.—See Bot. Absts. 4, Entry 602.

994. Hegner, Robert W. **The effects of environmental factors upon the heritable characteristics of Arcella dentata and A. polypora.** Jour. Exp. Zool. 29: 427–441. *7 fig.* Nov. 20, 1919.—See Bot. Absts. 4, Entry 601.

995. Jones, D. F. **Selective fertilization in pollen mixtures.** Proc. Nation. Acad. Sci. U. S. 6: 66–70. *1 table.* 1920.—See Bot. Absts. 6, Entry 1700.

996. Keene, M. Lucille. **Studies of zygospore formation in Phycomyces nitens Kunze.** Trans. Wisconsin Acad. Sci. 19: 1196–1219. *3 pl. 17 fig.* 1919.—See Bot. Absts. 5, Entry 1950.

997. Mangenot, G. **Sur l'évolution du chondriome et des plastes chez les Fucacées. [The evolution of chondriomes and plastids in the Fucaceae.]** Compt. Rend. Acad. Sci. Paris 170: 200–201. *1 fig.* 1920.—Mitochondria and small phaeoplasts are found in all stages of the development of the oogonium and the formation of the oosphere, and also in the fertilized egg and the embryo. It thus appears that the phaeoplasts persist throughout the entire life-cycle in *Fucus*, although in young tissues and reproductive organs they are smaller and more sensitive to reagents. Fucosane is present at all stages except, perhaps, during the early development of the oogonium.—*C. H. and W. K. Farr.*

998. Mascre, M. **Sur le rôle de l'assise nourricière du pollen. [The rôle of the tapetum in pollen.]** Compt. Rend. Acad. Sci. Paris 168: 1120–1122. *4 fig.* 1919.—See Bot. Absts. 5, Entry 1898.

999. Mirande, Robert. **Sur le carmin aluné et son emploi, combiné avec celui du vert d'iode, en histologie végétale. [Carmine-alum and its use as a counter stain with iodine green.]** Compt. Rend. Acad. Sci. Paris 170: 197–199. 1920.—The author finds that carmine-alum is not a stain for cellulose but stains pectic bodies. This conclusion is based upon the failure of carmine-alum to stain either cellulose fibers, such as those of cotton, or tissues from the cell-walls from which pectic materials have been extracted. On the other hand it does stain macerated portions of carrot or filaments of certain algae, such as *Cladophora* and the Siphonales. The author also holds that the staining of delignified tissues by iodine-green is to be attributed to the presence of pectic substances.—*C. H. and W. K. Farr.*

1000. Moreau, Fernand. **Notions de technique microscopique.—Application à l'étude des champignons. [Rudiments of microscopical technique. Its application to the study of fungi.]** Bull. Trimest. Soc. Mycol. France 34: 137–191. *35 fig.* 1919.—See Bot. Absts. 4, Entry 1131.

1001. O'Neal, Claude E. **Microsporogenesis in Datura Stramonium.** Bull. Torrey Bot. Club 47: 231–241. *2 pl.* 1920.—In *Datura Stramonium*, a favorable plant for cytological investigation, the bivalent chromosomes are cut from the spirem thread as loops, which may take on twisted forms, circles, or the U-shape. The bivalents are twelve in number and retain their individuality very strikingly until the telophase of the second division. No physical basis was found for occurrence of mutants nor for the Mendelian characters studied by other workers.—*P. A. Munz.*

1002. Parmenter, Charles L. **The chromosomes of parthenogenetic frogs.** Jour. Gen. Physiol. 2: 205–206. Jan. 20, 1920.—See Bot. Absts. 4, Entry 694.

1003. Parmenter, Charles L. **Chromosome number and pairs in the somatic mitoses of Ambystoma tigrinum.** Jour. Morph. 33: 169–249. *9 pl.* Dec. 20, 1919.—See Bot. Absts. 4, Entry 693.

1004. Smith, Bertram G. **The individuality of the germ-nuclei during the cleavage of the egg of Cryptobranchus allegheniensis.** Biol. Bull. 37: 246–286. *9 pl.* Oct., 1919.—See Bot. Absts. 4, Entry 771.

1005. Stevens, Neil E. **The development of the endosperm in Vaccinium corymbosum.** Bull. Torrey Bot. Club 46: 465–468. *4 fig.* 1919.—See Bot. Absts. 4, Entry 991.

1006. Stomps, Theo. J. **Gigas-mutation mit und ohne Verdoppelung der Chromosomenzahl. [Gigas mutation with and without doubling of the chromosome number.]** Zeitschr. indukt. Abstamm. Vererb. 21: 65–90. *3 pl., 4 fig.* July, 1919.—See Bot. Absts. 4, Entry 778.

1007. Stork, Harvey E. **Studies in the genus Taraxacum.** Bull. Torrey Bot. Club 47: 199–210. *2 pl.* 1920.—See Bot. Absts. 6, Entry 1770.

1008. Tischler, G. **Untersuchungen über den anatomischen Bau der Staub- und Fruchtblätter bei Lythrum Salicaria mit Beziehung auf das Illegitimitätsproblem. [Studies of the anatomical structure of the stamens and carpels in Lythrum Salicaria with reference to the problem of illegitimacy.]** Flora 11, 12 (Festschrift Stahl): 162–192. 1918.—See Bot. Absts. 4, Entry 788.

1009. Tower, W. L. **The mechanism of evolution in Leptinotarsa.** Carnegie Inst. Washington Publ. 263. *viii + 384 p., 19 pl., 161 fig.* 1918.—See Bot. Absts. 4, Entry 794.

1010. Woodburn, William L. **Preliminary notes on the embryology of Reboulia hemisphaerica.** Bull. Torrey Bot. Club 46: 461–464. *Pl. 19.* 1919.—See Bot. Absts. 4, Entry 1045.

## FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*
J. V. Hofmann, *Assistant Editor*

1011. Acosta, Celsa. **Colección de maderas cubanas. [Collection of Cuban woods.]** Revist. Agric. Com. y Trab. 3: 55. 1920.—The Agric. Exp. Sta. of Cuba is said to have a nearly complete collection of the woods (about 500) of Cuba. Thirteen of these are described in this article as to specific weight and common uses.—*F. M. Blodgett.*

1012 Algan, H. [Rev. of: Huffel, G. **Economie forestière. [Forest economy.]** Vol. II, 2nd ed. *502 p., 131 fig.* 1919.] Bull Trimest. Soc. Forest. Franche-Comté et Belfort 13: 170–176. 1920.

1013. Anonymous. **Délits forestiers au XVIII$^{e}$ siècle. [Forest trespasses in the eighteenth century.]** Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 168–170. 1920.—A study of the court records of Luxeuil between 1730 and 1760 indicates that forest trespasses in the eighteenth century differed remarkably little from those of today. Judgments were rendered in accordance with the celebrated ordinance of 1669, the severity of which was, however, considerably tempered in actual practice.—*S. T. Dana.*

1014. Anonymous. **La légende de Dévoluy. [The legend of Devoluy.]** Rev. Eaux et Forêts 58: 66–68. 1920.—The canton of Devoluy has been cited by numerous authors as a classic example of the disastrous results of deforestation, which they assume to have taken place toward the end of the eighteenth century, at about the time of the French Revolution. A careful study by M. Philippe Arbos has shown that this is not the case; that the deforestation of the canton (if, indeed, it was ever wooded) dates back at least to the end of the seventeenth century; and that erosion was active as far back as 1458. The canton does not appear to have suffered so severely as some of its neighbors. It has decreased less in population, agriculture has picked up somewhat, and the number of stock in relation to the population has increased considerably.—*S. T. Dana.*

1015. Anonymous. **Naturschutz. [Preservation of natural sites.]** Forstwiss. Centralbl. 41: 333–336. 1919.—There is danger, lest, with the extensive cultivation of moor and waste

lands now under way, certain wild sites of great aesthetic and scientific value may be destroyed. Preservation of some of the moors is of especial importance for research in zoology, botany, and geology. Steps have already been taken to reserve from cultivation or afforestation some areas of particular scientific interest, such as two moors containing the dwarf birch (a relic of the ice-age), and various other small moors. Some other waste lands should also be preserved in their wild state—notably the "pontine hills," which have a steppe flora left from the ice-age, composed of such species as *Stipa pennata*, *S. capillata*, *Adonis vernalis*, *Prunus fruticosa*, *Coronilla varia* and *Astragalus*. These areas are so small in relation to the total area of moor and waste land that no economic loss will result from their reservation.—*W. N. Sparhawk.*

1016. ANONYMOUS. **Production de bois après guerre. [Wood production after the war.]** Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 162–165. 1920.—A recent report (reprinted in full) by M. DABAT, Director-General of Waters and Forests, emphasizes the urgent need for the increased production of saw timber. In order to relieve the present situation as quickly as possible he suggests the development of transportation facilities in the less accessible forests and the utilization of the enormous forest resources of the French colonies. The latter involves the education of consumers in regard to the technical qualities of colonial woods, standardization of nomenclature, and revision of the tariff so that the more common colonial woods will not be taxed at the same rate as the more precious ones. Measures which will not yield tangible results for some time include lengthening the rotation of coppice stands; maintaining a larger number of reserves in coppice under standards; converting coppice under standards into high forest; converting hardwood coppice of poor yield into coniferous stands, particularly in mountainous regions and on poor soils; reforestation of unproductive lands; and the purchase of forests by the State, communities, and public service corporations with a view to managing them for the production of saw timber. M. DABAT also urges that the State assist private owners in the handling of their forests; that a service be created for the study of forest statistics and forest economics, as well as of the technical qualities and uses of native, colonial, and foreign woods; and that forest experiment stations be organized under the direction of the National School of Waters and Forests.—Nothing but commendation can be given to the program proposed by M. DABAT. But to carry out such a program and to practice the intensive silviculture which it contemplates, requires men as well as good intentions. It will therefore remain merely a dead letter if the administration persists in its present tendency to decrease, rather than to increase, the forest personnel.—*S. T. Dana.*

1017. ANONYMOUS. **Skovenes Udbytte 1918–1919. [Total receipts and amount cut in the forests, 1918–19, Denmark.]** Dansk Skovforenings Tidsskr. 5: 135–138. 1920.—The total cut from the Danish State forests during the fiscal year 1918–19 is given as 268,948 cubic meters of material; about 20 per cent above the average cut. The total net receipts amounted to 4,318,341 crowns. The total forest area is 57,118 hectares and of this the non-producing area 17,439 hectares. The net receipts for the total forest area is given as 72.45 crowns per hectare; in some cases this was as high as 329.27 crowns. On the basis of the valuation four working circles yielded above 15 per cent interest, three above 10 per cent and eight above 6 per cent; there being in all twenty circles in the producing forest area. (One hectare is 2.47 acres and one crown usually 28 cents.)—*J. A. Larsen.*

1018. BOAS, L. H. **The possibilities of paper making in Australia.** Australian Forest. Jour. 3: 106–107. 1920.—A plea for a careful study of the pulp and paper industry and its establishment in Australia.—*C. F. Korstian.*

1019. BOAS, L. H. **Some lines of forest product research in Australia.** Australian Forest. Jour. 3: 75–77. 1920.—The author believes that the most fundamental line of forest research needed in Australia today is a complete investigation of the mechanical properties of all timbers likely to be of commercial value.—*C. F. Korstian.*

1020. Buffault, Pierre. **L'évolution forestiére, à propos de la réorganization intérieure du service des eaux et forêts.** [The evolution of the forester.] Rev. Eaux et Forêts 58: 57–60. 1920.—Forest officers should not confine themselves to the management of the public forests and the supervision of fishing. It is of constantly increasing importance that they should also assist private owners and communities in the handling of their forest lands; secure at least approximate information regarding the resources of those forests not submitted to the forest régime; keep more closely in touch with market conditions and the wood-using industries; and encourage the development of fish culture. These functions are already being exercised by a number of foresters on their own initiative with excellent results, and should be taken into consideration in connection with the proposed reorganization of the forest service. —*S. T. Dana.*

1021. Cannon, D. **Le Douglas.** [Douglas fir.] Rev. Eaux et Forêts 58: 80. 1920.—Douglas fir is not particularly exacting in its demands on soil fertility and prefers siliceous to clayey, and especially to calcareous, soils. As a general rule exotics should be planted on the best available sites and given considerable attention, particularly when young.—*S. T. Dana.*

1022. Cardot, E. **La reconstitution forestière.** [Forest reconstruction.] Rev. Eaux et Forêts 58: 89–92. 1920.—Extracts are given from the preface to "Études sur l'Aménagement des Forêts," by L. Tassy, written shortly after the Franco-Prussian war. The principal conclusions to be drawn from these extracts are that the national forests should be improved (notably by the conversion of coppice into high forest) and enlarged, and that adequate appropriation for the work should be made. These conclusions are equally applicable today in considering the problem of repairing the damages to French forests caused by the recent war.—*S. T. Dana.*

1023. Curtis, Otis F. **The upward translocation of food in woody plants. II. Is there normally an upward transfer of storage foods from the roots of trunk to the growing shoots?** Amer. Jour. Bot. 7: 286–293. 1920.—See Bot. Absts. 6, Entry 1310.

1024. de la Hamelinaye, H. **Valeur d'avenir des baliveaux.** [Future value of reserves.] Rev. Eaux et Forêts 58: 37–39. 1920.—The future value of reserves in coppice under standards is of great importance in evaluating the damages in areas devastated by the war. The value of trees of the same age in stands handled under the same rotation varies considerably according to the fertility of the site and the vigor of the trees. A detailed example is given of the method of calculation used by the author.—*S. T. Dana.*

1025. Gill, Walter. **Annual progress report upon state forest administration in South Australia for the year ended June 30, 1919.** *12 p., 6 pl., 2 maps.* Woods and Forests Dept. South Australia, 1919.—This is the regular administrative report of the Department for the period mentioned. It is reported that, of 392,860 trees planted, an average of 90.25 per cent were alive at the close of the year, the greater part being eucalypts and pines. *Pinus ponderosa* was planted in the Second Valley Forest, with a notable survival. The year showed an excess of receipts over expenditures.—*C. F. Korstian.*

1026. Guyot, Ch. **Deux devises de politique forestière.** [Two schools of forest policy.] Rev. Eaux et Forêts 58: 25–28. 1920.—In a recent article in the same serial, M. Raux advocated the public control of private cuttings. Under pretext of conserving the public interest he would destroy, without compensation and at the expense of the owner, the very essence of private property, namely, the right of the owner to dispose of his forest as he sees fit. The days when kings exercised complete control over the property of their subjects are past. Today the citizen in France is regarded as capable of managing his own affairs. Whenever the public interest demands the placing of certain restrictions on the right of property, these restrictions must be accompanied by just compensation. Such control as M. Raux suggests would be vigorously opposed by private owners. Many of these already manage their forest

lands as well as the State, and the great majority are ready to follow voluntarily the example set by the public forests. Private owners are not responsible for their failure so far to take advantage of the law of July 2, 1913, permitting them to place their lands under the technical direction of the State. The regulations recently issued providing for the execution of this law will make it possible for all who care to do so to take advantage of it.—The unfortunate lowering in 1906 of the penalties for forest trespasses was primarily the work of a politician of the "authoritative" school, and cannot be charged to the advocates of a "liberal" forest policy. To withdraw the control over fishing bestowed upon the Administration of Waters and Forests in 1896, as proposed by M. Raux in order to make available a larger personnel for the carrying into effect of State control of private lands, would be a step in the wrong direction.—*S. T. Dana.*

1027. Guyot, Ch. **Jurisprudence. [Legal matters.]** Rev. Eaux et Forêts 58: 9–14. 1920.—Discusses the application of certain provisions of the Code Forestier and of the law of April 7, 1851, to the clearing of land in which both the Forest Service and the Engineer Corps are interested. [See also next following Entry, 1028.]—*S. T. Dana.*

1028. Guyot, Ch. **Jurisprudence. [Legal matters.]** Rev. Eaux et Forêts 58: 40–41. 1920.—A forest owner is responsible for damage done by rabbits to neighboring property when he has not taken sufficient measures to restrict the rabbits in his forest to a normal number. [See also next preceding Entry, 1027.]—*S. T. Dana.*

1029. Haugh, L. A. **Barkens likenbevoksning som udtryk for bögens vaekst. [Development of lichens on the bark of beech—an index to growth.]** Dansk Skovforenings Tidsskr. 5: 86–91. *1 pl.* 1920.—The author quotes O. Gallöe in saying that the development of lichens in beech forests depends largely upon the amount of available light in late winter and spring, that growth of lichens is largely absent from young beeches which hold their dead leaves over winter, and that soil rich in organic mould and earthworms does not favor the growth of lichens on the ground because of the constant turning over of the leaves, etc. The author states his own conclusions in saying that the optimum sites for the growth of beech are poor in lichen growth because the trees grow rapidly thereby shedding the outer layers of bark often, and because the denser stands allow insufficient light. In an ordinary forest the slower growing trees carry more lichens.—*J. A. Larsen.*

1030. Hickel. **Le douglas en France. [Douglas fir in France.]** Rev. Eaux et Forêts 58: 5–8. 1920.—Douglas fir (the "green" variety) is less exacting in its soil requirements than indicated by Hubault in a previous issue of the same serial. It has no aversion to calcareous soils, does not suffer from late spring frosts, but will stand neither overhead shade nor the competition of herbaceos vegetation. It does best in western France, but thrives in many other parts of the country. Few species, and certainly no native one, can rival it in rate of growth. It is reproduced more easily than Scotch pine, forms denser stands, and produces a superior wood. It should be tried out in the reforestation of devastated areas.—*S. T. Dana.*

1031. Jagerschmidt, J. **L'exploitation des coupes en regie en Alsace et en Lorraine. [Logging by the forest administration in Alsace and Lorraine.]** Rev. Eaux et Forêts 58: 29–36. 1920.—Logging by the forest adminstration has been the rule for many years in Alsace and Lorraine, in forests submitted to the forest régime. It has given excellent results from a financial point of view, by doing away with middlemen, and has reduced trespasses by making it possible for local residents to obtain small quantities of sawtimber and fuel at reasonable prices. A somewhat detailed account is given of the handling of woods labor, the keeping of accounts, and the making of sales.—*S. T. Dana.*

1032. Jones, Owen. **Soil fertility: Can it be preserved in Australian forests?** Australian Forest. Jour. 3: 71–72. 1920.—The author offers three proposals: (1) Prevent of forest fires. (2) Underplant eucalypts with some shade-enduring species to act as a soil cover, and inci-

dentally to clean and force them up. (3) Confine eucalypts to areas where soil and climatic conditions are most favorable utilizing poor areas for species better calculated to preserve or improve soil fertility. [See also Bot. Absts. 6, Entry 1044.]—*C. F. Korstian.*

1033. Kashyap, S. R. **Abnormal number of needles in the spurs of Pinus longifolia.** Jour. Indian Bot. 1: 115–119. 1919.—See Bot. Absts. 5, Entry 1894.

1034. Kreitmann, L. **La conversion de la forêt domaniale de Montiers-sur-Saulx. [The conversion of the national forest of Montiers-sur-Saulx.]** Rev. Eaux et Forêts 58: 93–99. 1920. —Prior to 1868 the national forest of Montiers-sur-Saulx was handled as coppice under standards, with a rotation of 25 to 30 years. In that year plans were made to improve the quality and yield of the stand by converting it into high forest. These plans were not carried out, however, and the forest is now in a deplorable condition, with few trees suitable for the production of satisfactory standards. If the forest is not to be completely ruined it is necessary that steps be taken at once to convert it into high forest, for which it is preeminenlty suited both by the quality of the soil and by the value of the products that it can produce. A rotation of 112 years should be used and preference should be given to beech, which does remarkably well here. In some cases artificial reforestation will be necessary for the establishment of a satisfactory stand.—*S. T. Dana.*

1035. Lecomte, Henri. **Atlas des bois de l'Indo-Chine. [Atlas of Indo-Chinese woods.]** [Author's Abstract.] Compt. Rend. Acad. Sci. Paris 170: 162–263. 1920.

1036. Lescuyer, Pierre. **Quelques reflexions sur le calcul des pertes d'avenir. [The calculation of future losses.]** Bull. Trimest. Soc. Forest. Franche-Comte et Belfort 13: 166–168. 1920.—In calculating the damage to stands or to individual trees resulting from their premature exploitation, some foresters use the formula $x = R\,\frac{1.op^m - 1}{1.op^n - 1}$, others the formula $x = \frac{R}{1.op^{n-m}}$. The second formula always gives a larger result, since, as is demonstrated mathematically, it includes not only the future value of the tree or stand but also the expense of management. The first formula is generally to be preferred, both because it confines itself simply to determining the future value of the prematurely exploited stand or tree without attempting to determine what will succeed it, and because it is doubtful whether there really is any expense of management in the case of one or a few isolated trees.—*S. T. Dana.*

1037. Lorenzen, Poul. **100-Aarig Adelgran paa Bornholm. [100-year noble fir (Abies pectinata) on Bornholm, Denmark.]** Dansk Skovforenings Tidsskr. 5: 92–101. *1 pl.* 1920. —A plantation made one hundred years ago yielded 1010 cubic meters of wood per hectare; the average diameter was 37 cm., the average height 32 meters and the total basal area 59.8 square meters.—*J. A. Larsen.*

1038. Mackay, H. **Forestry in Victoria.** Australian Forest. Jour. 3: 116–119. 1920.— The first installment of a serial article, briefly discussing past and present forest resources of Victoria and their economic significance.—*C. F. Korstian.*

1039. Mattirolo, Oreste. **Considerazioni sulla convenienza dell'impiego del legno in specie nella costruzione dei "lungheroni d'ala" degli aeroplani. [Use of wood in aeroplane-wing frames.]** Atti R. Accad. Lincei, Rend. (Cl. Fis. Mat. e Nat.) $28^1$: 249–253. 1919.—Observations made on wooden parts of broken aeroplanes indicate that weakness was due to irregular growth of the tree not made evident by the tests in use. Ash wood (*Fraxinus excelsior* Linn.) adjacent to breaks was easily separable into hard granules, these granules being apparently made up of elements characteristic of spring growth. The conclusion is reached that some material of more uniform texture than wood must be found for this use.—*F. M. Blodgett.*

1040. Metcalf, Woodbridge. **A precocious youngster.** Amer. Forestry 26: 15. *1 fig.* 1920.—See Bot. Absts. 5, Entry 1899.

1041. Perdrizet, A. **Taillis et futaie. [Coppice and high forest.]** Rev. Eaux et Forêts **58**: 2–4. 1920.—The rotation of all coppice stands owned by the state should be lengthened, or else they should be converted into high forest as rapidly as possible, in order to produce a larger proportion of sawtimber. This will involve a certain loss in revenue, which can be minimized, however, if the state will do its own logging.—*S. T. Dana.*

1042. Ross, C. R. **Annual report of the Forest Department for the year ending 31st March, 1919, including report on railway sleeper plantations for the same period.** *34 p.* Forest Dept. Union of South Africa, 1919.—This is the usual administrative report for the period. The extension and constitution of state forests, management of state forests, financial results, timber imports and exports and general administration are discussed. The protection of forests is given considerable attention especially with respect to insects, fungous diseases, animals and climatic causes. Silviculture is treated rather extensively under the heads of Natural reproduction, Artificial reproduction, Drift sands operation, Cultural operations, Sylvicultural notes and Trial of new species. Detailed information is given on the railway-sleeper plantations.—*C. F. Korstian.*

1043. Schlich, Sir Wm. **The Bagley Wood sample plots.** Quart. Jour. Forest. **13**: 266–268. 1919.—Ten experimental plots of important economic forest trees now 10 to 12 years of age, in Bagley Wood (Oxford, England), afford a rather interesting comparison of height and volume growth. The trees and their total average height growth were: Douglas fir (Pacific Coast form), 32 feet; western hemlock, 23 feet; western red cedar, 23 feet; Sitka spruce, 26 feet; Japanese larch, 22 feet; Tyrolese larch, 26 feet; Corsican pine, 21 feet; white pine, 19 feet; Douglas fir (Colorado form), 16 feet; and Norway spruce, 15 feet. The trees were all spaced 4 × 4 feet with the exception of Corsican pine, which was spaced 3 × 3 feet. The annual volume production varies from 306 to 85 cubic feet and follows closely the height growth, with the exception of Corsican and white pines. The annual volume increment of Corsican pine is out of proportion to its height growth because of its close spacing, and white pine has developed an exceptionally large diameter considering its comparatively moderate height growth. —*C. R. Tillotson.*

1044. Stoate, P. N. **The eucalypts in relation to soil fertility.** Australian Forest. Jour. **3**: 112–113. 1920.—A reply to a paper by Owen Jones (Bot. Absts.), controverting Jones' proposals. [See also Bot. Absts. 6, Entry 1032.]—*C. F. Korstian.*

1045. Vestergaard, N. **Adelgran i Jäderborg Dyrehave. [Noble fir (Abres pectinata?) in Jäderborg game reserve, Denmark.]** Dansk Skovforenings Tidsskr. **5**: 81–86. *4 pl.* 1920. —The last trees from three groups of plantations set out in 1765 have been cut. The largest tree measured 1.27 meters in diameter, at breast height, 40.7 m. in height and contained 21.4 cubic meters of wood.—*J. A. Larsen.*

1046. Weis, Fr. **Om Gödkning i Skoven. [Fertilization of forest soils.]** Dansk Skovforenings Tidsskr. **5**: 102–131. 1920.—A discussion of the needs, means, methods and advantages of fertilizing forest soils for greater production of material.—*J. A. Larsen.*

1047. Wild. **Das übliche Sprichwort "der erste Wald taugt nichts" trifft nicht immerzu. [The proverb "the first forest is good for nothing" not always true.]** Forstwiss. Centralbl. **41**: 440. 1919.—Actual yield of 80-year-old stand of spruce, which originated from broadcasting seed on an old field (Germany), was 973.75 cu. m. per hectare, or a mean annual growth of 12.17 cu. m. per annum. Average middle diameter was 27 cm., average length of stem 26 m.—*W. N. Sparhawk.*

1048. Wilson, E. H. **The romance of our trees. VII. The beeches.** Garden Mag. **31**: 115–119. *4 fig.* 1920.—See Bot. Absts. 6, Entry 1471.

# GENETICS

George H. Shull, *Editor*
James P. Kelly, *Assistant Editor*

1049. Allendorf and Ehrenberg. **Die Aufgaben des Sonderausschusses für Zuckerrübenbau. [Special problems of sugar-beet breeding.]** Mitteil. Deutsch. Landw. Ges. 1919: 531-534. 1919.—Breeders are urged to produce a higher-yielding beet without raising salt-content or lowering sugar-content; or with only a small lowering of the latter. Effects of closest inbreeding should be tested out. For distilleries a beet high in salt and protein might be bred. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 112. Dec., 1919.]—*J. P. Kelly.*

1050. Anonymous. **Polnische Getreide- und Kartoffelzuchtgesellschaft. [Polish grain and potato breeders association.]** Zeitschr. Pflanzenzücht. 6: 116-117. June, 1918.

1051. Anonymous. [German rev. of: Correns, C. **Ein Fall experimenteller Verschiebung des Geschlechtsverhältnisses. (A case of experimental shifting of the sex ratio.)** Sitzungsbericht. d. k. Preuss. Akad. Wissenschaft. 51: 658-717. 1917.] Zeitschr. Pflanzenzücht. 6: 98. June, 1918.

1052. Anonymous. [German rev. of: Havas, G. **Rendellenességek a közönséges kenderen, Cannabis sativa L. var. monophylla. (Dwarf hemp plants due to inbreeding.)** Kisérletügyi Közlémények Jahrb. 1916: 712-717. 1916.] Zeitschr. Pflanzenzücht. 6: 99. June, 1918.

1053. Anonymous. [German rev. of: Kraus, C. **Untersuchungen über die Vererbungsverhältnisse bei Nachkommenschaften reiner Linien. (Studies on inheritance ratios in progenies of pure lines.)** Fühlings Landw. Zeitg. 66: 457-487. 1917.] Zeitschr. Pflanzenzücht. 6: 100. June, 1918.

1054. Anonymous. [German rev. of: Lotsy, J. P. **L'Oenothera de Lamarck (Oenothera Lamarckiana de Vries) considérée comme chimère nucléaire. (Lamarck's Oenothera (Oenothera Lamarckiana de Vries) considered as a nuclear chimera.)** Arch. Néerland. Sci. Ser. 3: 342-350. 1917. (See Bot. Absts. 2, Entry 439.)] Zeitschr. Pflanzenzücht. 6: 103. June, 1918.

1055. Anonymous. [German rev. of: Mayer-Gmelin, H. **Mededeelingen omtrent enkele kruisings en veredelingsproefnemingen. (Reports on several experiments in crossing and selection.)** Cultura 30: 1-19. *4 pl.* 1918. (See Bot. Absts. 4, Entry 675.)] Zeitschr. Pflanzenzücht. 6: 103-104. June, 1918.

1056. Anonymous. [German rev. of: Terasvuori, K. **Über Finnland feldmässigen gebaute Erbsenformen. Experimentelle Vererbungsuntersuchungen mit besonderer Berücksichtigung der Anzahl der Samenanlagen und Samen in den Hülsen. (On forms of peas largely grown in Finland. Genetical studies with special reference to number of ovules and seeds in the pods.)** Acta Soc. pro fauna et flora Fennica 40: 1915.] Zeitschr. Pflanzenzücht. 6: 105-106. June, 1918.

1057. Anonymous. [German rev. of: Urban, J. **Über die Farbe des Rübenkrautes früh- und spätreifender Rüben. (On the color of the plant of early and late-ripening beets.)** Zeitschr. Zuckerrübenindust. Böhmen 42: 281-297. 1918.] Zeitschr. Pflanzenzücht. 6: 107. June, 1918.

1058. Anonymous. [German rev. of: von Ryx, G. **Ein neues Beispiel einer Knospenmutation bei den Kartoffeln. (A new example of bud mutation in potatoes.)** Deutsch. Landwirtsch. Presse 2: *1 fig.* 1918.] Zeitschr. Pflanzenzücht. 6: 105. June, 1918.

1059. ANONYMOUS. [German rev. of: ZADE, A. **Der Hafer. Eine Monographie auf wissenschaftlicher und praktischer Grundlage. (Oats. A monograph on scientific and practical principles.)** *8vo., 355 p., 32 fig.* Fischer: Jena, 1918. (See Bot. Absts. 2, Entry 467.)] Zeitschr. Pflanzenzücht. 6: 107. June, 1918.

1060. ARMBRUSTER, LUDWIG. **Messbare phaenotypische und genotypische Instinktveränderungen. Bienen und Wespengehirne, neu verglichen und als Mass benutzt in Fragen der Stammes- und Staatengeschichte sowie Vererbung und Genogenese. Nebst anhang über Nomada. [Measurable phenotypic and genotypic changes of instinct. Bee and wasp brains compared anew and used as a measure in questions of race and state history, as well as heredity and genogenesis, with an appendix concerning Nomada.]** Arch. Bienenkunde 1: 1–40. *5 pl. 8 fig.* 1919.

1061. BARTOS, W. **Der Einfluss der Veredlung auf den Wert der Rübe. [The influence of breeding on the value of the beet.]** Zeitschr. Zuckerind. Böhmen 42: 299–302. 1918. [Anonymous German rev. in: Zeitschr. Pflanzenzücht. 6: 98. June, 1918.

1062. BECKER, J. **Vererbung gewisser Blütenmerkmale bei Papaver Rhoeas. [Inheritance of certain floral characters in Papaver Rhoeas.]** Zeitschr. Pflanzenzücht. 6: 215–221. *3 fig.* 1918.—Author presents observations on markings at base of petals in case of 40,000 corn poppies. Best developed marking consists of two parts, an inner black fleck usually elongated radially (designated by +s) which is capped toward outside by wide white spot (+w). Petals may occur without markings (−s −w), with black bar only (+s −w), with white spot alone (−s +w), or with both markings (+s +w). Possible combinations total 16 since inner pair of petals may be marked independently of outer petals but only nine of the 16 actually occur, since +s and +w appear in outer petals only when they are also in inner petals. +s and +w may show in inner petals even though lacking in outer. To explain author postulates two inhibiting factors, $H_1$, acting only on inner petals, and $H_1$ and $H_2$ affecting both inner and outer petals; further, that simplex doses of genes for +s and +w dominate $H_1$ while duplex combinations are supposed to dominate both $H_1$ and $H_2$. No experimental data bearing on this hypothesis were obtained. In unfavorable environment all markings are reduced or absent.—*James P. Kelly.*

1063. BENDERS, A. M. **Het percentage der verwantenhuwelijken. [The frequency of consanguineous marriages.]** Genetica 2: 51–54. Jan., 1920.—Influence of consanguinity of parents upon posterity has always attracted the attention of practical eugenicists, especially in medicine. It is especially desirable to know the true percentage of consanguineous marriages among man. Author has made statistical studies; he classifies the patients of some Dutch institutions of neuropathics according to their religions, into three groups: Protestants, Catholics and Jews. He found among Protestants the percentage of 2.2, Catholics 1.1, Dutch-Jews 8.5 and Portuguese-Jews 25.4, this last number being, because of the small total number, not wholly exact. In the total of inhabitants (30 Protestants : 20 Catholics : 1 Jew) the percentage of consanguineous marriages in Holland may be stated to be 1.9; probably this number may be somewhat too high for two reasons: (1) Out of the great number of marriages, the consanguinity of which was unknown and therefore the question in the author's blanks unanswered, far the greater part will be nonconsanguineous, and (2) Between consanguinity of parents and nervous-diseased posterity there may perhaps be some relation, so that the consanguinity in this material is found in more cases, than between parents of same posterities.—*M. J. Sirks.*

1064. BLARINGHEM, L. **Couleur et sexe des fleurs. [Color and sex of flowers.]** Compt. Rend. Soc. Biol. 83: 892–893. June, 1920.

1065. BOLK, L. **Hersenen en Cultuur. [Brains and culture.]** *63 p., 1 fig.* Scheltema en Holkema's Boekhandel: Amsterdam, 1918.—Various examples are discussed by the writer, that characteristics of human embryos and those of the chimpanzee are similar, while in later

development the chimpanzee changes and gets other appearance, man being more conservative and fixing the embryonal qualities. From these facts the following conclusion is drawn: "that the causes of the loss of hairy skin in man, except on the skull, are already at work in the embryonal development of the Primates. Thus it can not be caused by external influences, nor by causes appearing for the first time at the moment of origin of man. Then it must be an internal factor for development at work already in principle in the Primates and reaching in man its maximum of force." This internal factor is cause of man's conservatism, and this fact is a determined variation. From this, the writer gives as a most far-reaching consequence the opinion, that the series of animals was fated to take its origin and its development as it has been taken; there was determined already in the first living organism the future of man-building.—*M. J. Sirks.*

1066. Breitenbecher, J. K. **The relation of water to the behavior of the potato beetle in a desert.** Carnegie Inst. Washington Publ. 263: 341–384. *5 fig.* 1918.—Egg-production is favored by high humidity. Beetles die if buried while activities are normal, but hibernate successfully if first somewhat desiccated. Hibernation may be induced by desiccation, except at low temperatures. Duration of hibernation depends on humidity and temperature, emergence from hibernation requiring moisture and warmth.—*A. Franklin Shull.*

1067. Cardot, Henry, and Richet, Charles. **Hérédité, accountumance et variabilité dans la fermentation lactique. [Heredity, adaptation and variations in lactic fermentation.]** Ann. Inst. Pasteur 33: 575. Sept., 1919.

1068. Cauli-rabi. **A Brassica cross.** Gard. Chron. 67: 8. Jan. 3, 1920.—One seed was presumed to result from a cross between an Autumn Giant cauliflower and a kohlrabi. The plant from this seed had a large swollen stem like the kohlrabi. The seeds of this plant, apparently from open pollination, produced plants having swollen stems of different shapes, but similarly shaped leaves.—*John Belling.*

1069. C[oulter], J. M. **Sex intergrades.** [Rev. of: Yampolsky, Cecil. **The occurrence and inheritance of sex intergradation in plants.** Amer. Jour. Bot. 7: 21–38. Jan., 1920. (See Bot. Absts. 5, Entry 502.)] Bot. Gaz. 70: 88. July, 1920.

1070. Dalcq, Albert. **Note sur la spermatogénèse de l'orvet. Aspect nucléaires de la lignée typique (existence d'un héterochromosome). [Note on the spermatogenesis of the orvet (Anguis). Nuclear aspects of the typical line (existence of a heterochromosome.]** Compt. Rend. Soc. Biol. 83: 995–997. 1920.

1071. Dammerman, K. W. **On hybrids of Batocera albofasciata and gigas.** Tijdschr. voor entomologie 62: 157–160. *2 pl.* 1919.—Some deviating forms of *Batocera*, partly caught in the field, partly reared on Ficus-wood, and supposed to be hybrids between *Batocera gigas* Drap. and *B. albofasciata* Degeer, led author to undertake experiments of cross-breeding between these two species. Small individuals of *B. gigas* were selected for these experiments, in order to prevent the difference in size from being a hindrance to crossing. The crosses were successful; only their number was small, viz., 14 from *albofasciata* male and *gigas* female and 15 from the reciprocal cross. The hybrids differed somewhat, among themselves in regard to color and design; as regards color they were on the whole intermediate, as regards design strongly matrocline. Offspring from these $F_1$-hybrids could not be obtained; they may be considered as being sterile. However a few descendants could be bred from *gigas* male and a female strongly resembling *gigas*, but with two white spots on the elytra, the parents of which however were not known. Of these five hybrids thus obtained, 3 were unspotted, while two of them showed a third spot beside the two maternal spots.—*M. J. Sirks.*

1072. De Wilde, P. A. **Verwantschap en erfelijkheid bij doofstomheid en retinitis pigmentosa. [Relationship and heredity in deaf-and-dumbness and retinitis pigmentosa.]** Diss. Amsterdam. *91 p.* 1919.—From an extensive investigation of the occurrence of deaf-mute-

ness and of retinitis pigmentosa in Holland the following conclusions have been drawn by the writer: A. Marriages of relatives gave three times as many cases of deafmuteness as marriages between non-relatives, if the number of marriages between relatives is taken as being 2 per cent of the total number of marriages; (B) If childless marriages are eliminated, deafmuteness occurs among Protestants in 13.6 per cent, when both parents are deaf-and-dumb; in 16.3 per cent when one of the parents is deaf-mute. For the Jews these numbers are 42.8 per cent and 33.3 per cent; for the Catholics in both cases 0 per cent; C. Deaf-muteness is found among Jews in 5.5 times as many cases as within the Christian inhabitants; D. The number of childless marriages is greater when both parents are deaf-mute and the number of children fewer in marriages between two deaf-mutes, than in marriages between deaf-mute and normal. True congenital deaf-mutes seem to be most frequent among the Jews.—For retinitis pigmentosa the writer gives these conclusions: A. The male sex is more susceptible than the female (relation 3:2), a fact already found by Nettleship; B. Out of the marriages of retinitis-pigmentosa patients 14 per cent are childless; C. The abnormality is most found among the Jews (6 times as many as might be expected), least among Catholics; D. Of all patients 22 per cent are born from consanguineous marriages (also found by Leber and Nettleship); E. Direct heredity could be confirmed in 25 per cent of the observed cases; F. Out of 167 patients of retinitis pigmentosa, 14 were also deaf-mutes; of these 14, 6 were born from consanguineous matings; G. Retinitis and deafness combined were found in 24 cases, of which 7 descended from consanguineous parents; retinitis with deafness as family-character was observed in 6 cases.—*M. J. Sirks.*

1073. DICKEL, F. **Die geschlechtsbildungsweise bei der Honigbiene wie deren grundsätzliche Bedeutung für die Geschlechtsbildungs frage überhaupt. [The manner of sex determination in the honey bee and its fundamental significance for the problem of sex determination in general.]** Zeitschr. Wiss. Insektenbiol. 13: 33. 19—.

1074. DOYER, J. J. TH. **Proeve van een onderzoek omtrent het familiair en hereditair voorkomen van tuberculose volgens de wetenschappelijk-genealogische methode. [Preliminary researches on the familial and hereditary occurrence of tuberculosis.]** Diss. *214 p., 7 genealogical trees, and 258 quarter tables.* J. B. Wolters: Groningen, 1920.—Author's medical practice has supplied to him a very extensive material for obtaining deeper insight in the relations of hereditary dispositions and tuberculosis. The author's studies are not yet decisive as to the question, whether differences in disposition may be inherited, but his provisional results show unmistakingly a certain individual disposition for tuberculosis, that may go farther by inheritance in succeeding generations. Seven genealogical trees and 256 quarter-tables contain a rich material for his provisional hypothesis.—*M. J. Sirks.*

1075. ELDERTON, ETHEL M. **Life-history albums.** Biometrika 12: 373–374. Nov., 1919.

1076. FRETS, G. P. **De polymerietheorie getoetst aan de erfelijkheid van den hoofdvorm. [The theory of polymeric factors, tested by heredity of head-form in man.]** Genetica 2: 115–136. Mar., 1920.—The results obtained by the writer in measuring a great number of lengths and breadths of human skulls, may be explained by accepting, according to the polymery-hypothesis of NILSSON-EHLE, a number (at most 13) of like factors, working in the same direction. These heritable factors may be identical. The important fact, that the amplitude of variability, shown by skull-measures of children, moves with the skull-measures of the parents, is in perfect harmony with the polymery-hypothesis, the experiments of Nilsson-Ehle giving a solid, though still narrow, basis for this hypothesis. Another explanation could be derived from the hypothesis of selection, as in its new form defended by Castle. In author's opinion however, the polymery-hypothesis has a greater degree of probability.—*M. J. Sirks.*

1077. FRETS, G. P. **Over de erfelijkheid van den hoofdvorm. [Heredity of head-form in man.]** Handelingen Nederl. Natuur- en Geneeskundig Congres (1919) 17: 350–359. 1920.—Brachycephalic as also dolichocephalic form of head are hereditary characters. Among brachycephalics must be noted two classes, macrobrachycephalics and microbrachycephalics.

Macrobrachycephalic form is dominant, dolichocephalic the recessive; dolichocephalic however is dominant, while microbrachycephalic would be recessive. Perhaps this dominance is correlated with sex; dolichocephalic form may be dominant in men, brachycephalic in women. Besides this sons seem to have a tendency to exhibit the headform of their fathers, daughters those of their mothers.—*M. J. Sirks.*

1078. Fruwirth, C. **Die gegenwärtige Organisation der Pflanzenzüchtung in Deutschland und in Österreich-Ungarn. [The present organization of plant breeding in Germany and Austria-Hungary.]** Nachr. Deutsch. Landw. Ges. Österr. 1919: 35–39. 1919.—After discussing actual conditions author presents view that creation of original stock of seed, following breeding, ought not to be work of small farms nor of associations of such. Advantages of author's methods are pointed out. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 118. Dec., 1919.]—*J. P. Kelly.*

1079. Fruwirth, C. **Allgemeine Züchtungslehre der landwirtschaftlichen Kulturpflanzen. (Handbuch der landwirtschaftlichen Pflanzenzüchtung Bd. I. Fünfte gänzlich neubearbeitete Auflage. [General genetics of agricultural plants. (Handbook of agricultural plant-breeding. Vol. I.) 5th ed., entirely revised.]** *8vo, xviii + 442 p., 8 pl., 89 fig.* Paul Parey: Berlin, 1920.

1080. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. II. Die Züchtung von Mais, Futterrüben und anderen Rüben, Oelpflanzen und Gräsern. [Handbook of agricultural plant-breeding. II. The breeding of maize, fodder beets and other roots, oil plants and grasses.]** *3rd. ed., 262 p., 50 fig.* Paul Parey: Berlin, 1918.—In third edition, larger than second by 60 pages, the sections on fodder beet, maize and other grasses especially have been rewritten to take account of recent work. Thorough handling of literature is emphasized. [From author's statement in Zeitschr. Pflanzenzücht. 7: 144–145. Dec., 1919.] —*J. P. Kelly.*

1081. Fruwirth, C., Th. Roemer, E. von Tschermak. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe. [Handbook of agricultural plant breeding. Vol. 4. Breeding of the four chief cereals and the sugar beet.]** *3rd ed., 8vo, xv + 504 p., 42 fig.* Paul Parey: Berlin, 1918.—Most parts of this new edition of volume 4 are remodelled, especially the hybridization sections, made necessary by the large amount of research of recent years. Recasting of one part has been due also to there being a new co-author, Roemer, who has written section on beets. Enlargement of present volume is kept within 40 pages by limiting general discussion and making reference to earlier edition for certain less frequently used portions. [From anonymous statement in Zeitschr. Pflanzenzücht. 7: 145. Dec., 1919.]—*J. P. Kelly.*

1082. Gassner, S. **Beiträge zur physiologischen Characteristik sommer- und winteranueller Gewächse, inbesondere der Getreidepflanzen. [Contributions on the physiological characteristics of summer and winter annuals with special reference to the cereals.]** Zeitschr. Bot. 10: 417–480. *7 fig., 2 pl.* 1918.—Author recalls his earlier experiments showing that with obligate winter-annual cereals shooting-up in spring requires a cold period during or subsequent to germination. In present paper he presents further experimental details. With Petkus summer-rye there was no after-influence of various temperatures during germination. Petkus winter-rye, bred from same original population as Petkus summer-rye, showed marked effects of temperature. The cold requirements of Svalöf Extra Squarehead were as great as in Petkus winter-rye but were less pronounced for Friedrichswerther winter-rye. Cold requirements of other varieties are also given. As distinguishing winter and summer cereals author emphasizes cold requirements of former and sensitivity to frost of latter and not relative length of life of the two kinds. These characteristics should be kept in mind in genetical work on summer and winter cereals. The need for low temperature and resistance to frost are positively correlated. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 118–120. Dec. 1919.]—*J. P. Kelly.*

1083. G[atenby], J. B. [Rev. of: Bower, F. O., J. G. Kerr, and W. E. Agar. **Lectures on sex and heredity delivered in Glasgow, 1917–18.** *16mo, vi + 119 p., 49 fig.* Macmillan Co.: London, 1919.] Science Progress 15: 152–153. July, 1920.

1084. Gates, R. Ruggles. **Heredity and eugenics.** Eugenics Rev. 11: 193–201. 12: 1–13. 1920.

1085. Grier, N. M. **Variation and distribution of leaves in Sassafras.** Biometrika 12: 372–373. Nov., 1919.

1086. Grosser, Otto. **Die Lehre vom spezifischen Eiweiss und die Morphologie, mit besonderer Anwendung auf Vererbungsfragen und den Bau der Plazenta. [The doctrine of specific proteins and morphology with special application to questions of heredity and the structure of the placenta.]** Anat. Anzeiger 53: 49–57. 1920.

1087. Hagedoorn-La Brand, A. C., and A. L. Hagedoorn. **Inherited predisposition for a bacterial disease.** Amer. Nat. 54: 368–375. July–August, 1920.—Review of evidence for inherited predisposition to disease. Experimental:—very minute mice related to the Japanese Waltzing type obtained from Japan and China crosses with albinos. $F_1$ and $F_2$ hybrids were obtained, also backcross $F_1 \times$ Japanese. Epidemic of staphylococcus occurred in mousery. Disease took rapid course and no spontaneous recovery was recorded. Proportion of mortality in various generations at weighings of January 4 and February 14 was calculated. All Japanese mice died. $F_2$, 31 litters gave total of 125 on January 4, 91 on February 14. No albinos of same age died among "very considerable number." No $F_1$ mice died among 14 observed. On a 3:1 basis $F_2$ expected 93.75:31.25, observed 91:34. Back-cross litters (14), expected 1:1 ratio, observed 25:32. Excess of deaths over those expected is considered as representing those due to all other causes. No experimental inoculation was attempted.—*C. C. Little.*

1088. Hansen, W. **Die sinnbildliche bewertung der Parzellen- und Zuchtpflanzen. [The valuation of plots and breeding plants by inspection.]** Illustr. Landw. Zeitg. 1918: 42. 1918. [Anonymous German rev. in: Zeitschr. Pflanzenzücht. 6: 99. June, 1918.]

1089. Harder, R. [German rev. of: Küster, Ernst. **Über weissrandige Blätter und andere Formen der Buntblättrigkeit. (On white-margined leaves and other forms of variegation.)** Biol. Zentralbl. 39: 212–251. *27 fig.* May, 1919. (See Bot. Absts. 4, Entry 644.)] Zeitschr. Bot. 12: 267–268. 1920.

1090. Harvey, Ethel Browne. **A review of the chromosome numbers in the Metazoa. II.** Jour. Morph. 34: 1–67. June 20, 1920.—This contribution, supplementing the author's previous work (Jour. Morphol., v. 28, Dec. 1916), completes list of chromosome numbers for the metazoa. Tabulation includes complete bibliography. Short historical and critical account is given and also a review of the occurrence of heterochromosomes. Conclusions are: (1) the chromosome number for each species is constant with a few exceptions; (2) there is a definite number of chromosomes characteristic of a related group of animals (the type number); (3) changes of number in related forms have resulted from the splitting or fusion of chromosomes.—*Bertram G. Smith.*

1091. Houwink, R. Hzn. **Erfelijkheid. Populaire beschouwingen omtrent het tegenwoordige standpunt der erfelijkheid, verzameld uit theorie en practijk. [Heredity. Popular presentation of the present status of heredity compiled from theory and practice.]** *62 p., 5 pl.* Stoomdrukkerij Floralia: Assen, 1919.—Brief popular treatise by a well-known expert in poultry-breeding. It contains the most important principles of heredity and propagation and their relations to poultry-breeding. The booklet is intended for the common breeder; without being too learned, the difficult subject is treated in easily comprehensible way.—*M. J. Sirks.*

1092. Kooiman, H. N. **Eenige opmerkingen naar aanleiding van Lotsy's artikel "De Oenotheren als kernchimaeren."** **[Some remarks on Lotsy's paper "The Oenotheras as nuclear chimeras."]** Genetica 2: 235–243. May, 1920.—Some theoretical remarks upon Lotsy's paper. With Lotsy, author is of opinion, that distribution of chromosomes according to the laws of chance gives a good explanation for simple Mendelism; but he does not accept the identification of factors, working in the same direction, as founded upon the same causes. He does not accept Lotsy's disavowal of the existence of genes, nor his hypothesis of chromosome-linkage. The *Drosophila* researches are not in accordance with this hypothesis; so for *Oenothera* it cannot be admitted without very strong arguments. For that reason the writer supposes that the most important characters of the *Oenotheras* are bound to genes, that are localized in the same chromosome. A strong linkage between these genes would then probably be responsible for the hereditary behavior of the *Oenotheras* according to Renner's researches. —*M. J. Sirks.*

1093. Kooiman, H. N. **Overzicht over enkele Oenothera-problemen.** **[Review of a few Oenothera-problems.]** Genetica 1: 134–148. Mar., 1919.—Critical summary of the most important Oenothera-papers of later years and of the problems they treat.—*M. J. Sirks.*

1094. Kroon, H. M. **De overerving der kleuren bij onze huisdieren, in het bijzonder by het paard.** **[Heredity of coat-color in domesticated animals, especially in the horse.]** Tijdschr. voor diergeneeskunde 47: 83–95. 1920.—See next following Entry, 1095.

1095. Kroon, H. M. **Nog eens. De overerving der kleuren bij onze huisdieren, in het bijzonder bij het paard.** **[Color inheritance in domestic animals, especially the horse. (2).]** Tijdschr. voor diergeneeskunde. 47: 312–314. 1920.—Following abstract represents next preceding entry (1094) as well as present one. First paper is a summary of the work done by previous authors, Harper, Robertson, Wilson, Sturtevant, Anderson, Wentworth, Walther, Stroever, Reimers for detecting the various inheritable factors for coat-color in horses. Author makes use of the nomenclature of Wentworth: *C*, chestnut, *H*, black, *B*, brown, *G*, gray, *D*, dappling, *R*, roan, *P*, piebald, *I*, diluting factor, *S*, star, and *M*, mane; he indicates the genotype combinations, corresponding with the various colors.—In the second paper a special case, mentioned by one of his correspondents is treated along lines indicated in the first article. A mare, White Mouse, gave by a dark chestnut stallion, The Rush, a white-born foal (White-born is the extreme form of piebald); thus $CCPP + CCpp = CCPp$.) A second time White Mouse was served by William IV, brown, and gave a piebald foal ($CCPP + CCHHBB = CCHhBbPp$); for the third time a foal was bred from White Mouse by Le Cid, a common gray (not white-born), the foal was at birth piebald, but became in the same summer wholly gray ($CCPP + CCHHBBGG = CCHhBbGgPp$) and a fourth foal was born from White Mouse by Cher Amour, a French chestnut ($CCPP + ccpp = CcPp$, a white-born foal). The mare White Mouse seemed therefore to be homozygous for the piebald factor *P*. -With our knowledge of the various color factors in horses such seemingly difficult cases may find a happy solution.—*M. J. Sirks.*

1096. Kuiper, K., Jr. **Onderzoekingen over kleur en teekening bij runderen. Naar experimenten van R. Houwink Hzn.** **[Researches on color and markings in cattle. Based on experiments by R. Houwink Hzn.]** Genetica 2: 137–161. Mar., 1920.—Author tries to show how the characteristic markings of the Dutch belted cattle are inherited in breeding within the race and in crossings with the Dutch spotted cattle. Mating two animals of Dutch belted, or an individual of Dutch belted with spotted, may give self-colored calves. A Dutch belted bull gave with 55 Dutch spotted cows 27 Dutch belted, 24 self-black, and 4 spotted calves. For explanation of this result the writer accepts two pairs of allelomorphic factors: *Ll* for belted markings, epistatic to *Ee* self-colored, and a repulsion between *L* and *E* in the reduplication-series 1:7:7:1. Accepting these conditions, the observed facts are explained easily. The writer supposes Dutch belted cattle are in most cases diheterozygous, or *LlEe*. The individuals with faulty markings, appearing in great number in crossings with spotted cattle,

are then *LLee* or *Llee*. Strong correlation exists between white feet and too large belting.—*M. J. Sirks.*

1097. Larger, R. **Théorie de la contre-évolution, ou dégénérescence par l'hérédité. [Theory of retrogressive evolution, or degeneration by heredity.]** *xiv + 405 p., 21 fig.* Félix Alcan: Paris, 1919.

1098. Lawritson, M. N., J. W. Hendrickson, and W. B. Nevens. **Pure-bred sires effect herd improvement.** Nebraska Sta. Circ. 8: 3–15. *7 fig.* 1919.—Semi-popular paper giving records of the daughters of three bulls, one Jersey and two Holstein-Friesian. The daughters' average milk and butter fat yield was increased over that of their dams by the use of these bulls. The conclusion is drawn that even the small breeder can afford to purchase a pure-bred bull as the increased worth of his sons and daughters will more than compensate for the extra first cost.—*John W. Gowen.*

1099. Lehmann, Ernst. **Bemerkungen zu dem Aufsatze von O. Renner: Mendel'sche Spaltung und chemisches Gleichgewicht. [Comments on the article of O. Renner: Mendelian splitting and chemical equilibrium.]** Biol. Zentralbl. 40: 277–286. June, 1920.

1100. Lienhart. **De la possibilité pour les éleveurs d'obtenir a volonté des males ou des femelles dans les races gallines. [On the possibility for the raiser of poultry to secure males or females at will in the Gallinaceae.]** Compt. Rend. Acad. Sci. Paris 169: 102–104. 1919. —The possibility rests, as the author states, upon the recognition of sex within the egg, before incubation commences. The experimental evidence is small in amount, consisting of two sets of 60 eggs each, each set being the 60 largest of several hundred. In the most favorable experiment 77 males out of 100 were obtained. The author believes that the large eggs give rise to males and the small ones to females. Further experiments are proposed.—*H. D. Goodale.*

1101. Loewenthal, Waldemar. **Ein veränderlicher, Milchzuckerspaltender Paratyphusbazillus. [A mutable paratyphoid bacillus fermenting lactose.]** Centralbl. Bakteriol. 83: 227–321. 1919.

1102. Lotsy, J. P. **Cucurbita-strijdvragen. De soort-quaestie; Het gedrag na kruising; Parthenogenese? I. Historisch overzicht. II. Eigen onderzoekingen. [Cucurbita-problems. The species-question. Results of crossing. Parthenogenesis? I. Historical review. II. New researches.]** Genetica I: 496–531. Nov., 1919. Ibid. 2: 1–21. *9 fig., 1 triple col. pl.* Jan., 1920.—The first part of this paper contains a historical summary of the facts thus far known about species-questions, hybridization and parthenogenesis in *Cucurbita*. It seems to be impossible to obtain hybrids among the Linnean species distinguished by Naudin: *C. maxima, C. pepo, C. moschata* and *C. melanosperma*, but it is easy to make hybrids between the different varieties within these species, at least within *C. maxima* and *C. pepo*. Previous researches had also indicated the existence of an important segregation in the $F_2$-generations of these hybrids. The process of parthenogenesis occurring among *Cucurbita* species according to the Hagedoorns is unproven and very doubtful.—The second part, containing an account of author's own researches, is summarized by the writer in the following sentences: Several, often very different, constant forms ("Jordanons") could be distinguished within the "Linneon" *Cucurbita maxima* as well as within the Linneon *C. pepo* in the sense of Naudin. Jordanons belonging to the same Linneon, cross easily and give fertile segregating hybrids. As yet, crosses between Jordanons belonging to different Linneons have had no result in the author's experiments. Considering the very large number of unsuccessful efforts it seems pretty safe to say that neither *C. pepo* nor *C. maxima* can be crossed with *C. melanosperma*, an equally strong opinion can not be given as to the possibility of crosses between *C. pepo* and *C. maxima;* those tried were unsuccessful, but the number of efforts was much less than in the case of crossings between *C. pepo* or *C. maxima* with *C. melanosperma*. Crosses between *C. pepo* and *C. aurantiaca* Willd. are as fertile and segregate as fully as those between

Jordanons belonging to the same Linneon, it should however be remembered that NAUDIN considers *C. aurantiaca* as a mere—though very definite—variety of *C. pepo*. Reciprocal crosses between *C. pepo* and *C. aurantiaca* show certain differences in the length and size of the fruits, these being in both cases matroclinous. Absolute certainty that these differences are not due to heterozygosis of the forms crossed was not obtainable, but this is, in view of the matroclinous inheritance in both reciprocal crosses, highly improbable. None of the forms of *Cucurbita*, cultivated by the author, was able to form seeds without having been fertilized. Neither apogamy, nor parthenogenesis has been met with. The cases of parthenogenesis in *Cucurbita* described by the Hagedoorns are most probably cases of fertilization by insects, due to insufficient isolation. Some of the forms investigated are parthenocarpous, i.e., they can form fruits without having been fertilized, but such fruits never contain any seeds with embryos.—*M. J. Sirks.*

1103. LOTSY, J. P. **De Oenotheren als kernchimeren. [The Oenotheras as nuclear chimeras.]** Genetica 1: 7–69. 113–129. 1919.—In the author's opinion the researches of RENNER as well as his own experiments have shown the extraordinary nature of *Oenothera Lamarckiana*; it is a nuclear chimera, resulting from two great factor complexes, localized in the chromosomes. These complexes, out of which the nuclear chimera is constructed, may be wholly independent of each other without exchange of chromosomes or of qualities and without dragging away of chromosomes; in that case no "mutants," properly "segregonts," appear. If a chromosome from one of the complexes is dragged out into the other, then new forms with varying numbers of chromosomes come into existence. Exchange of chromosomes or of qualities give segregonts with the same chromosome number as the original form. The percentage of appearance of these segregonts depends upon the more or less easy exchange of chromosomes or of qualities; a very easy exchange gives high numbers of segregonts or quantitative "mass-mutations." In *Oenothera* no species nor hybrids exist, only nuclear chimeras, and the different exchanges between the constituent chromosome-complexes give origin to the "mutant" forms. The fact of crossing-over, resulting in dragging away a part of a chromosome by another, causes also the possibility of crossing-over in homozygotes or in pure lines. These "mutants" in pure lines result from intranuclear chromosome-changes, not from newly-formed genes.—The various consequences of this opinion with respect to general problems, as the nature of genes, mutability, and the theory of MORGAN, are discussed in detail, but are of course of a somewhat hypothetical character.—*M. J. Sirks.*

1104. LOTSY, J. P. **Een opwekking om voort te gaan met het kruisen van individuen tot verschillende linneonten van het geslacht Verbascum behoorend. [Encouragement to proceed with crossings of individuals belonging to different Linneons of the genus Verbascum.]** Genetica 2: 22–26. Jan., 1920.—The failure of many experiments in growing posterity of *Verbascum*-hybrids has given us a strong impression of the absolute infertility of these hybrids. Exceptions however were already found by DARWIN (Jour. Linn. Soc. 10) and by MENDEL (fide CORRENS Abh. Sächs. Gesellsch. Wiss. 1905) and indicate the possibility of obtaining fertile hybrids within this genus; this induces the author to stimulate other geneticists to renew these experiments.—*M. J. Sirks.*

1105. LOTSY, J. P. **Heribert-Nilsson's onderzoekingen over soortsvorming b¨ Salix met opmerkingen mijnerz¨ds omtrent de daarin en in publicaties van anderen uitgeoefende kritiek aan mijn soorts-definitie. [Heribert-Nilsson's researches about species-formation in Salix with my remarks upon his and other writers' critique of my definition of species.]** Genetica 2: 162–168. Mar., 1920.—The ninth chapter of HERIBERT-NILSSON's paper about his *Salix*-hybrids (Lunds Univ. Aarsskr. XIV. 28. 1918) is, in the opinion of the writer, of enough theoretical importance to give a translation of it in Dutch. This translation is accompanied by a reply of the author to NILSSON's remarks about the nature of "species" as also to those of other writers.—*M. J. Sirks.*

1106. LOTSY, J. P. **Theoretische steun voor de kruisingstheorie. [Theoretical arguments for the theory of evolution by means of hybridization.]** Genetica 2: 214–234. May, 1920.—

A defense of author's well-known theory of evolution by means of hybridization against some of the opponents: Dendy, Jeffrey, and an exposition of arguments brought together by other writers (Heribert-Nilsson, Winge, Ernst, Gerould, and others) that support the author's views.—*M. J. Sirks.*

1107. MacBride, E. W. **The method of evolution.** Scientia 14: 23–33. 1920.

1108. O'D[onoghue], C. H. [Rev. of: Morgan, Thomas Hunt. **The physical basis of heredity.** *14 × 21 cm., 300 p., 117 fig.* J. B. Lippincott Co.: Philadelphia, 1919. (See Bot. Absts. 5, Entry 422.)] Science Progress 15: 150–151. July, 1920.

1109. O'D[onoghue], C. H. [Rev. of: East, Edward M., and Donald F. Jones. **Inbreeding and outbreeding.** *14 × 11 cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919. (See Bot. Absts. 4, Entry 571; 5, Entries 437, 1607, 1695.)] Science Progress 15: 151–152 July, 1920.

1110. O'D[onoghue], C. H. [Rev. of: Lillie, Frank Rattray. **Problems of fertilization.** *13 × 19 cm., vii + 278 p., 19 fig.* Univ. Chicago Press: Chicago, 1919. (See Bot. Absts. 5, Entry 410.)] Science Progress 15: 152. July, 1920.

1111. Pézard, A. **Castration alimentaire chez les coqs soumis au régime carné exclusif. [Alimentary castration in cocks subjected to an exclusive meat diet.]** Compt. Rend. Acad. Sci. Paris 169: 1177–1179. 1919.—A discussion of certain experiments of F. Houssay in a paper entitled "Variations expérimentales. Études sur six générations de poules carnivores (Arch. de Zool. exp. et gén., t. 6, 1907, p. 137 à 332." Author concludes that Houssay's observation of atrophied testes and their consequences did not result directly from the flesh diet, but because the birds did not maintain good health.—*H. D. Goodale.*

1112. Renner, O. [German rev. of: Ernst, A. **Bastardierung als Ursache der Apogamie im Pflanzenreich; eine Hypothese zur experimentellen Vererbungs- und Abstammungslehre. (Hybridization as the cause of apogamy in the plant kingdom; an hypothesis for experimental evolution and genetics.)** *8vo, xv + 665 p., 2 pl., 172 fig.* Gustav Fischer: Jena, 1918. (See also Bot. Absts. 3, Entries 2113, 2151.)] Biol. Zentralbl. 40: 288. June, 1920.

1113. Richey, H. W. **Factors of fruitfulness.** [Rev. of: Wiggans, C. C. **Some factors favoring or opposing fruitfulness in apples.** Missouri Agric. Exp. Sta. Res. Bull. 32: 1–60. *6 fig.* 1918. (See Bot. Absts. 5, Entry 1696.)] Bot. Gaz. 70: 162–164. Aug., 1920.

1114. Roemer, Th. **Über Lupinenzüchtung. [On lupine breeding.]** Deutsch. Landw. Presse 1919: 174–175. 1919.—Breeding can secure in lupines a condition of uniform ripening which in these plants is dependent on uniform germination and uniform blooming. In both of these respects individual selection has shown differences. Seed harvest can be increased also by use of best plants revealed by individual selection. Average fruitfulness of pods is hereditary. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 136. Dec., 1919.]—*J. P. Kelly.*

1115. Roepke, W. **Over selectie van meerderjarige cultuurgewassen in tropisch Nederland. [On selection of perennial cultivated plants in the Dutch tropics.]** Rede Landbouwhoogeschool. *24 p.* H. Veenman: Wageningen, 1920.—As an inaugural address at the Agricultural College of Wageningen the author gives a summarizing report of the work done in the Dutch East Indian colonies in selecting and breeding better races of rubber, tea, coffee, cocoa and quina; he discusses the most important parts of his breeding, and amelioration of the existing material; the vegetative propagation of worthy types on a small scale and on a large scale, hybridization and introduction of new species. Each of these methods has given to the Dutch East Indies valuable types of cultivated plants.—*M. J. Sirks.*

1116. ROFFO, A. H. **Sur le rôle du facteur race dans la transmission du cancer chez le rat. Transformation progressive d'une race non réceptive. [On the rôle of the race factor in the transmission of cancer in the rat. Progressive transformation of a non-receptive race into a receptive one.]** Compt. Rend. Soc. Biol. 83: 968–970. 1920.—See Bot. Absts. 6, Entry 1749.

1117. SAINT-HILAIRE, H. GEOFFROY. **L'elevage dans l'Afrique du Nord. [The breeding industry in North Africa.]** *xi + 530 p., 33 pl.* Augustin Challamel: Paris, 1919.

1118. SCHADE, H. J. M. **Kunnen proefondervindelnke mutaties worden opgewekt bij bacterien? [Can experimental mutations be obtained in bacteria?]** Nederlandsch. Tijdschr. voor Geneeskunde 63: 811–814. 1919.—The researches of SEIFFERT (Deutsche medizinische Wochenschrift 1911. no. 23) and of RICHET and CARDOT (C. R. Acad. Sciences, Paris, 31 March, 1919) have been repeated by the author. Their conclusions accepted the possibility of obtaining mutations, by means of bacterial cultures in special media. Author made his cultures, as SEIFFERT had done, of *B. coli* in agar, to which malachite-green had been added; from the original culture, that could be only grown in agar-nurture with 20 mg. in 10 cc. agar, a strain was cultivated, that was resistant to 666 mg. in the same quantity of agar; after three months this resistance was not diminished. The conclusion of SEIFFERT and others seemed to be right. That this is not true, however, is shown by the author in a way, different from his previous method. By means of emulsions of his cultures in NaCl-solution, colonies were obtained from very diluted cultures; the strain "adapted" to 666 mg. of malachite per 10 cc. agar grew on each culture as well; this "mutated" strain, after once growing upon pure agar, had lost its adaptation for the greater part; the longer the period of growing upon pure agar, the less the adaptation and the number of resulting colonies. In his first mentioned researches, common cultures did not bring these differences to light because of the immense number of bacteria contained in only one little globule of the culture; after diluting the cultures by means of emulsions, the differences made themselves apparent. Thus the conclusions of SEIFFERT and of RICHET and CARDOT are false because of their inexact methods.—*M. J. Sirks.*

1119. SCHERMERS, D. **Erfelijkheid en rasverbetering. [Heredity and race-improvement.]** Schild en Pijl 10: 1–26. 1919.—From the point of view of positive Christianity the writer discusses the consequences, drawn by the modern eugenicists from the facts given by processes of fertilization and of Mendelism. He is extraordinarily skeptical. The great and insuperable difficulties, encountered by the study of heredity in man, especially as related to psychical abnormalities, leads him to deny the practical significance of eugenics; medical examination before marriage can only give good results for alcoholism, syphilis and tuberculosis; in other cases it will be wholly insufficient, while neomalthusianism is fatal. The prospects of a possible improvement of the human race are, owing to the lack of well-established knowledge, unfavorable.—*M. J. Sirks.*

1120. SIEGEL, W. **Das Recht des Gemüsezüchters. [The right of the vegetable breeder.]** *8vo.* Frick: Wien, 1919.—Author takes up the well-known idea of according to breeders working with cross-pollinated vegetables protection from neighboring cultures of the same species. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 146. Dec., 1919.]—*J. P. Kelly.*

1121. SIRKS, M. J. **De analyse van een spontane boonenhybride. [The analysis of a spontaneous bean hybrid.]** Genetica 2: 97–114. Mar., 1920.—Among a number of plants of the dwarf speckled cranberry bean, gathered in 1917, one plant was found whose seeds had not a chamois (yellowish-white) violet-striped seedcoat, but a liver-brown one with blue striping. These seeds had thus been formed on a hybrid plant, resulting from a crossing with an unknown pollen parent, occurring in 1916. By sowing these seeds in 1918, an $F_2$-generation was obtained and in 1919 an $F_3$-generation. The analysis of these $F_2$ and $F_3$ generations with regard to their seed colors, gave cause to accept seven hereditary factors, present in beans and responsible for these colors. These factors were:—(1) The ground-factor, *P*, responsible for color in general; its presence without others causes the chamois color, its absence gives a white seed-

coat, independent from the other possibly present factors; (2) *G*, factor for yellowish-brown color; chamois is, if *G* is present, changed into yellowish-brown; (3) *L*, factor for liver-brown, by which yellowish-brown is changed into liver-brown, or in homozygotes dark-brown; (4) *V*, factor that changes chamois into violet and yellowish-brown into brown-violet. The factor *L* is epistatic to *V*, the presence of *V* thus being indistinguishable when the formula is *Ll* or *LL*; (5) *Gr*, factor for gray color, changing chamois into gray-chamois, yellowish-brown into gray-yellowbrown and violet into gray-violet. (6) *B*, factor changing violet into blue. This factor covers all other factors and is thus epistatic to them; (8) *S*, striping factor, by which blue, violet and gray in the superficial layers are restricted into stripes. Then one sees a background of chamois, yellowish-brown, liver-brown, gray-violet or bluish-brown. If this background is violet or gray, then *S* exercises also its influence upon it and makes this violet marbled; in consequence these beans show two types of markings, viz., striping and marbling. The other colors are not marbled in the background. This factor *S* may be present in cryptomeric state in the chamois, yellowish-brown and liver-brown colors, but cannot be proven here, because it does not influence these colors.—Probably there are also linkages between some of these factors; perhaps between *P*, *V* and *S* on the one hand and between *G*, *L*, *B* and *S* on the other. This is the more striking because the formulae derived from the splitting-numbers are for the mother-plant, the dwarf speckled cranberry bean, *PPVVSS*, and for the unknown father-plant, that must have had white seedcoats, *ppGGGrGrvvLLBBss*.—*M. J. Sirks.*

1122. Sirks, M. J. **De methodiek der erfelijkheidsleer. [The methodism of genetics.]** Tijdschr. voor diergeneeskunde. 47: 207–217. 1920.—Progress of genetics can only be obtained if a critical examination of the methods in use has preceded the work itself. The critique of the methods in use cannot be sharp enough; in modern times we are no longer contented with the primitive and ancient method of speculation without facts. These facts may be gained by two different ways: direct research of the genetical factors, present in a cell, by cytological studies, and by indirect researches in judging the hereditary factors of an individual by observations or experiments thereupon. This direct method, the cytology, may give us many results, but has thus far not solved the great problem of the localization of heritable factors. In itself cytology is insufficient. Indirect methods of genetics there are four; we may study the chain, that binds the heritable factors in the genotype with the observed characteristics of the individual in its phenotypes in two directions: beginning with the genotype as Schaxel does and studying the development of this genotype into the phenotype by cyto-morphological methods or studying by going back from the phenotype-characters and trying to find out the genotypical factors causing them (Phenogenetica Haeckers).—In the second place indirect study of genotype may be drawn along other lines: study of ascendance (Galton) and study of descendance (Mendel). In far the most cases only the last of these methods is sufficient; the methods of Schaxel and of Haecker however may perhaps give us still many results in elucidating the long way between genotypic factors and phenotypic characters.—*M. J. Sirks.*

1123. Sirks, M. J. **Erfelijkheids- en selectieonderzoekingen bij Vicia-soorten. I. De navelkleur van Vicia Faba. [Researches on heredity and selection in species of Vicia. I. Navel color in Vicia Faba.]** Genetica 2: 193–199. 1920.—The navel color in the English bean (*Vicia Faba*) was studied as a heritable character by breeding the posterities of individual plants; partly these plants were isolated, partly they were allowed to flower without isolation. From isolated heterozygous plants splitting offspring in ratio 3:1 were always obtained; black navel color was dominant and white recessive. The heterozygotes could in some cases be distinguished from the homozygotes because of their not black, more gray navel color. Free-flowering plants never gave a more or less exact ratio 3:1; their offspring split in every possible ratio; even in the offspring of white-navel recessives often a great number of black-navel plants could be observed, the results of spontaneous hybridizations.—*M. J. Sirks.*

1124. Sirks, M. J., and J. Bijhouwer. **Onderzoekingen over de eenheid der linneaansche soort Chrysanthemum leucanthemum L. [Investigations on the homogeneity of the**

**Linnean species Chrysanthemum leucanthemum L.]** Genetica 1: 401–442. Sept., 1919.—Biometric measurements of length and breadth of ray-flowers made very probable, that the Linnean species *Chrysanthemum leucanthemum* L. contains several strains of hereditarily different character, in this sense, that this "species" is a mixture of types, differing in inheritable qualities, and their respective hybrids.—By systematic breeding and counting the ray-flowers of a number of plants grown in families, it could be proven, that this supposition was right and that this Linnean species is far from a unity, but a mixture of types and hybrids. This makes it possible to grow out of this species a number of families, differing in hereditary characters, among others those relating to the number of ray flowers; these families seem to have the Fibonacci-numbers 21 and 34 as modes.—*M. J. Sirks.*

1125. Sirks, M. J. **Die kritische punten van het evolutievraagstuk. [Critical points of the evolution hypothesis.]** Genetica 1: 70–91. Jan., 1919.—The problem of evolution is by most authors taken as a whole; in reality it may be analysed and divided in four great problems, that are more or less favorable to experimental research, the only right way for finding an answer free from speculations. These four critical points out of the mass of problems are: —(1) The origin in nature of new forms, in hereditary factors varying from their parents; experimental research has thus far only shown one cause of this origin: hybridization, that is, fusion of gametes differing in hereditable properties. All other ways of origin of new forms have been thus far unproven.—(2) The existence in nature of groups of individuals, characterized by possessing a great complex of hereditary factors. Answering this problem has been till now unexperimental; mathematical considerations may show the necessity of divergence of a very complicated population into different strains of homozygotic individuals, but also circumstances of life,—isolation, dying out of certain forms and perhaps influence of circumstances on hybrid-splitting—may cause the differentiation of a population into different strains. In this direction a great and extensive field of experimental labor is to be done, before a well-founded answer can be given. (3) The dying out of forms and of groups of forms is more a historical problem; perhaps it will be possible, by means of submission of populations of known genetic constitution to various circumstances of life.—(4) Is there in natural evolution a progression or only a succession? This is a problem of a very subjective character; it is wholly inaccessible for experiments and will remain in the long future a point of philosophical discussion.—*M. J. Sirks.*

1126. Sirks, M. J. **Raszuiverheid en fokzuiverheid. [Purity of race and purity of breeding.]** Genetica 1: 539–552. Nov., 1919.—In genetics every word and every term has gone through its own evolution; this brings in many cases great difficulties for obtaining an exact definition of each of these terms. Every term changes its meaning with the changes of genetics itself; they become more and more sharpened or they must be banished from the geneticists terminology. A discussion of the terms purity of race and purity of breeding is given here by the writer. In pre-Mendelian times identity of portrait (description of figure) could be accepted as indicating purity of race; the Galtonian theory has changed this standard into identity of ancestry, and Mendelian researches have given as definition of purity of race identity of posterity. The exact geneticist would go farther and take as definition the identity of the gametes, formed by an individual as standard for purity of breeding. In practice it is not yet possible to accept this sharpest definition; there are cases, that an individual gives a posterity, seemingly identical, without forming only one sort of gametes. These cases are treated by the writer in detail: the case of the white mice, among others, the case of apogamy in plants without reduction-division and the case of eliminating of the homozygote combinations as in yellow mice and in *Oenothera*-species.—A method of determining the purity of breeding in cases where direct experiments are difficult, is indicated by Schmidt of Copenhagen by his method of diallel (cross-wise) matings.—*M. J. Sirks.*

1127. Sirks, M. J. **Verwantschap als biologisch vraagstuk. [Relationship as a problem of biology.]** Genetica 2: 27–50. Jan., 1920.—The problem of relationship has always taken a central position in genetics; its analyses along the lines of modern genetics is a subject of

great importance. In this paper the writer has indicated the necessity of sharply distinguishing two different views of relationship; relationship in descendance or genealogic relationship and relationship in capacities, gentoypic relationship. These two sorts of relationship may not be confounded in modern literature of genetics as has till now been done by many writers; they are not at all identical; two individuals may in genealogical sense be very nearly related, though their genotypes are highly different; inversely the genotypes of two individuals can be identical, however they don't show any genealogical relationship. In the great lines of phylogeny a narrow tie will perhaps have bound these two relationships, but the presence of the one is not even an indication for the other's appearance.—Now it will be a subject of a great many researches to find good methods for establishing these relationships: the ancient method of portrait-building and comparing is no longer sufficient. Experimental methods only can be accepted. But not all the researches, called experimental, are really experimental. Really experimental methods for proving the existence of genealogical relationships may be found easily; systematic breeding and a well-developed administration is the only means of getting an insight into genealogical relationship. Demonstration of genotypic relationship however is not so easy; till nowadays we have only breeding methods, and we can state genotypic relationship only by means of systematic crossings. This method however is in its possible usefulness very limited; in practical sense it has been thus far sufficient, but the exact genetics, trying to find a more or less mathematical judgment of the genotype of a given individual cannot be content with this in many cases inadequate method; we must try to find another, perhaps chemical method, to determine the genotype of an organism. A critical and more refined judgment of methods for finding bloodrelationship, but then applied to gametes, may in future lead to great results.—*M. J. Sirks.*

1128. SIRKS, M. J. **Uit het Instituut voor veredeling van landbouwgewassen. Vergelijking van gerst- en tarwerassen, van het Instituut afkomstig met andere voortreffelijke rassen van deze gewassen. 1915–1917. [From the Institute for the Improvement of Agricultural plants. Comparison of barley and wheat varieties originating from the Institute with other superior races of these plants. 1915–1917.]** Med. Landbouwhoogeschool Wageningen 14: 1–34, 210–232. 1918.—Gives only some reports of comparisons of newly bred varieties of wheat (Millioen III and Imperiaal IIa) with the well-known Wilhelmina, that show the great value of these varieties of wheat. The results of tests with new races of barley (Pollux and Castor) were less favorable. —*M. J. Sirks.*

1129. SNELL, K. **Farbenänderung der Kartoffelblüte und Saatenanerkennung. [Color changes of the potato blossom and the recognition of varieties.]** Der Kartoffelbau 1919: 1–3. 1919.—Author calls attention to importance laid on color in recognition of varieties but a questionnaire proved that with many varieties color variations occur that are "spontaneous" while with others they appear as non-hereditary "modifications"; these are, of course, not distinguishable by inspection. Author thinks that all varieties possess power of pigment formation and bloom white if conditions for development are absent. It is suggested that in judging the variety, plants with deviations in flower color should be especially attended to only when they also vary in other respects. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 137–138. Dec., 1919.]—*J. P. Kelly.*

1130. SOMMER, K. **Über Kartoffelzüchtung und vergleichende Anbauversuche mit Neuzüchtungen auf der Domäne Ellischau. [Potato breeding and comparative cultural tests of new varieties on the Ellischau estate.]** Nachr. Deutsch. Landw. Ges. Österr. 1919: 190–193. 1919. —Calls attention to hybridization and plant-selection work undertaken, and special mention is made of large yields of single plants. [From anonymous review in Zeitschr. Pflanzensücht. 7: 138. Dec., 1919.]—*J. P. Kelly.*

1131. STAHEL, G. **Eerste verslag over de werkzaamheden ten behoeve vàn de selectie van Koffie en Cacao. [First report on the effectiveness of selection in coffee and cacao.]** Dept. Landbouw. in Suriname, Paramaribo, Bull. 36. *23 p.* 1919.—Coffee and cocoa plants generally more or less heterozygous and efforts at vegetative multiplication of good plants are

described. Author records contribution of a fund by a Surinam breeding association by which a selection inspector for the plantations is supported. Figures are given on varying productivity of coffee and cocoa trees with number of individuals selected as mother plants. Methods of vegetative propagation are described. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 138–139. Dec., 1919.]—*J. P. Kelly.*

1132. Tammes, T. **De leer der erffactoren en hare toepassing op den mensch. Rede, uitgesproken bij het aanvaarden van het ambt van buitengewoon hoogleeraar aan de Rijks-universiteit te Groningen. [The theory of hereditary factors and its applicability to man. Address delivered on assumption of the office of Professor Extraordinarius in the State University at Groningen.]** *24 p.* Wolters: Groningen, 1919.—A discussion of the principles of factorial constitution of organisms; the writer thinks them as Morgan does, localized in the chromosomes, according to the linkage of all *Drosophila*-factors in four groups and of all *Pisum*-factors in seven groups, in harmony with their haploid chromosome numbers 4 and 7. If then these principles might be applied to improvement of the human race, the great number of chromosomes in man (diploid 47 and 48) is a difficult hindrance for locating the various human hereditary factors in the chromosomes; the inheritance of human characters is very complicated and it is therefore impossible to give certain indications for human amelioration. But possible is the amelioration of circumstances of life for man; it changes only the phenotype not the genotype, but it is the only thing we can obtain in the nearest future.—*M. J. Sirks.*

1133. Thomson, J. Arthur. [French rev. of: Larger, R. **Théorie de la contre-évolution, ou dégénérescence par l'hérédité. [Theory of retrogressive evolution, or degeneration by heredity.]** *xiv + 405 p., 21 fig.* Félix Alcan: Paris, 1919.] Scientia 14: 52–54. 1920.

1134. Thomson, J. Arthur. [French rev. of: Hegner, R. W. **The germ-cell cycle in animals.** *x + 346 p., 84 fig.* Macmillan & Co.: New York, 1914.] Scientia 14: 51–52. 1920.

1135. Tjebbes, K., and H. N. Kooiman. **Erfelijkheidsonderzoekingen by boonen. III. Albinisme. [Hybridization experiments with beans. III. Albinism.]** Genetica 1: 532–538. *1 pl., 3 fig.* Nov., 1919.—The authors have made some experiments with a strain of albino-throwing beans of the species *Phaseolus vulgaris*. The seeds of one plant, E. 9. 1916, sown in 1917, gave 26 green-leaved plants and 8 ivory-white ones, indicating monohybrid segregation. 1918 the rest of the seeds from E9. 1916, produced again about three green seedlings: 1 white one.—1918 albinotic seedlings were grafted on normal green ones. The best method proved to be splice-grafting, the hypocotyl of the albinotic seedling and a node of the green one being cut across diagonally and united by means of a string of wet raffia. The albino then can profit from the food present in the cotyledons and of the green leaf, left to the node.—In this way two plants in 1918 and two descendants of one of these in 1919 were raised to maturity and all of them produced the first, simple, leaves without the least trace of green color, developing little patches of chlorophyll on the compound leaves and green stripes on the pods.—As to the origin of this strain the authors venture to suggest, that it may have arisen from the cross of a flower on an albinotic branch with a flower on a normal one, of a sectorially chimaeric plant. Also the loss of the factor, that enables the plant to make chlorophyll, may have taken place in one flower. The question too arises, whether the green patches on the leaves and the stripes on the pods are caused by some chemical influence of the normal plant or that we deal with an extreme case of variegation. To clear this and other questions the work will be continued.—*H. N. Kooiman.*

1136. Urban, J. **Hochpolarisierende Rübe und ihre Nachkommenschaft. [High-polarizing beets and their progeny.]** Zeitschr. Zucker-Industr. Böhmen 42: 387–391. 1919.—Three groups of mother beets whose average sugar content were 20.28 per cent, 20.66 per cent and 21.14 per cent respectively gave progeny whose averages were 21.47 per cent, 21.29 per cent and 21.59 per cent sugar. Three generations showed no noticeable influence of small differences in sugar percentage of mother beets upon averages of progeny. Same mother beets seriated for weights showed a negative correlation between size and sugar percentage. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 141–142. Dec., 1919.]—*J. P. Kelly.*

1137. Urban, J. **Über die Farbe des Rübenkrautes früh und spätreifender Rüben. [On the color of the plant of early and late-ripening beets.]** Zeitschr. Zuckerrübenindus. Böhmen 42: 281–297. 1918.—See Bot. Absts. 6, Entry 1057.

1138. van Herwerden, M. A. **Over eenige nieuwe opvattingen in de celleer. [On some new discoveries in cytology.]** Genetica 1: 130–133. Mar., 1919—A discussion of the continuity of the nucleus, for long years an axiom of the cytology, but now by the beautiful researches of Buchner (Arch. f. microscop. Anat. 91: 1. 1918) no longer an axiom but a subject of research that may perhaps give us a new view upon the ontogenetic origin and perhaps the phylogenetic origin of this most important part of the cell. The basiphile grains in the eggs of hymenopteres giving rise to accessory nuclei will give still much material for research.—*M. J. Sirks.*

1139. Volkart A. **40. und 41. Jahresbericht. Schweizerische Samenuntersuchungs- und Versuchsanstalt in Oerlikon-Zürich. [40th and 41st Annual Reports. Swiss seed control and experiment station in Oerlikon-Zurich.]** Landw. Jahrb. Schweiz. 1919: 1–40. 1919.—The station's breeding work on cereals, beans and beets is reviewed. The isolation of strains by single-progeny tests and also improvement by repeated selections are mentioned. In 1913 hybridization was commenced. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 142. Dec., 1919.]—*J. P. Kelly.*

1140. von Caron-Eldingen. **Physiologische Spaltungen ohne Mendelismus. [Physiological segregation without Mendelism.]** Deutsch. Landw. Presse 1919: 515–516. 1919.—Author discusses thick-eared wheat infested with rust spores. The grain, whether treated or not gave rise to some long-eared plants. In plats with untreated grain only the long-eared were rusty. Author assumes a physiological segregation, not Mendelian in character, which conditions the long-eared character and the susceptibility. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 114–115. Dec., 1919.]—*J. P. Kelly.*

1141. von Ryx, Georg. **Zahlenmässige Bestimmung der Kornschönheit bei Braugerste. [Numerical determination of beauty of grains in brewing barley.]** Zeitschr. Pflanzenzücht. 6: 109–166. *2 fig.* June, 1918.

1142. von Tschermak, E. **Beobachtungen über anscheinende vegetative Spaltungen an Bastarden und über anscheinende Spätspaltungen von Bastardnachkommen speziell Auftreten von Pigmentierungen an sonst pigmentlosen Deszendenten. [Observations on apparent vegetative splitting in hybrids, and on apparently belated splitting in hybrid offspring, especially the occurrence of pigmentation on otherwise pigmentless descendants.]** Zeitschr. indukt. Abstamm. Vererb. 21: 216–232. *1 fig.* Nov., 1919.—Four cases of bud mutation in beans, barley, and peas, are given which occurred after a cross as follows: (1) a dark-seeded bean which had bred true for 8 generations following a cross of dark- and light-seeded Scarlet Runner beans gave one plant with both typical seeds and aberrant light-colored seeds with distinct pattern; (2) a low-growing white-flowered plant resulting from a cross of *Phaseolus multiflorus* × *P. vulgaris* again crossed by a low-growing red-flowered plant from same source gave one plant in $F_1$ with short stature during the summer but which late in the season began to climb; (3) a barley variety with compact spikes crossed by a normal sort gave one plant in $F_1$ with two stalks, one of which had a normal spike the other compact; (4) a pea with yellow cotyledons crossed by another yellow-cotyledon kind gave one plant with one fully matured green seed among the usual yellow seeds. Such cases as these author considers to be vegetative segregation and compares them with two instances of seed segregation of complex nature in which appearance of new forms is delayed as (a) two white-flowered bean plants of complex hybrid ancestry gave red flowers in $F_1$ with normal segregation in $F_2$. (b) a bean plant with seeds having green cotyledons and green seed coats which bred true for 4 generations following a cross of a green by yellowish-brown-coated variety produced one plant with all seeds having colored markings. Author holds that there is a relation between such delayed segregations which at present cannot be distinguished from complex Mendelian phenomena

and the cases of vegetative segregation reported by himself and by others. He considers that an association or disassociation during growth whereby factors may become active or inactive may account for these observed facts.—*D. F. Jones.*

1143. VON UBISCH, G. **Gerstenkreuzungen.** **[Barley crosses.]** Landw. Jahrbücher 53: 191–244. *3 pl., 18 fig.* 1919.—Aim of present contribution is to induce breeders to pay more attention to the laws of hybridization. Author discusses behavior in crossing of several barley traits, such as basal bristles, dentation of lower glume, thickness of ear, number of rows in head, and others. He also treats procedure for quantitative characters, linkage, and abnormalities. At the close an example is taken up to show how breeder may achieve his aim more quickly by attending to laws of heredity. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 141. Dec., 1919.]—*J. P. Kelly.*

1144. WEBBER, H. J. **Necessity of selecting stocks in citrus propagation.** California Citrograph 5: 177, 198–199. *1 table, 5 fig.* Apr., 1920.—A brief restatement of the main features of the bulletin abstracted in Bot. Absts. 5, Entry 498.—*H. B. Frost.*

1145. WILSON, E. H. **A new hybrid lily. L. imperiale.** Gard. Chron. 67: 255. *1 fig.* May 22, 1920.—Many hundred plants of two [presumably hybrid] lilies, *L. regale* Wils., and *L. Sargentiae* Wils., were grown near together in Massachusetts. Among seedlings of *L. regale* there were noticed three intermediate plants. These were presumed to have been due to pollination by *L. Sargentiae.* One of them is figured and described.—*John Belling.*

# HORTICULTURE

J. H. GOURLEY, *Editor*

## FRUITS AND GENERAL HORTICULTURE

1146. CALVINO, MARIO. **Propagación de las plantas por extaca.** **[Propagation of plants by cuttings.]** Revist. Agric. Com. y Trab. 3: 4–9. *18 fig.* 1920.

1147. COOPER, J. C. **Improving the seedling walnut.** Better Fruit 14[6]: 7, 36. Dec., 1919.—Scoring cards for both the tree and the nut are given together with a brief discussion of the value of obtaining a good seedling of English walnut for commercial propagation in the Northwest. The author is a walnut grower of long experience.—*A. E. Murneek.*

1148. CRANDALL, C. S. **The apple cross—Tolman × Malus Toringo.** Proc. Amer. Soc. Hortic. Sci. 16: 60–66. (1919) 1920.—Tolman, a well known standard variety of apples was crossed with a dwarf form of *Malus Toringo.* The seeds from the resulting fruits were planted and hybrid trees grown. In general appearance the trees strongly resemble the male parent except that they are not dwarf in habit and greatly exceed *Malus Toringo* in vigor of growth. The fruit of the hybrids bears no resemblance to those of either parent; they are intermediate in size, but to occupy a median position, they would have to be many times heavier and have the diameter more than doubled. While the color was a uniform yellow, it was not the yellow of either Tolman or *Malus Toringo,* but rather a dark dull orange color. The author states that the outstandng fact regarding the group of seedlings is the extent of the domination of the dwarf, small fruited male parent and the corresponding suppression of resemblance to the mother plant. He states, "This dominance of *Malus Toringo* characters is indicative of a degree of stability and fixity only acquired by existence through many generations and we must assume this plant to be a true species and very near if not identical with the wild type." [See also Bot. Absts. 6, Entry 1653.]—*E. C. Auchter.*

1149. CURTIS, OTIS F. **The upward translocation of food in woody plants. II. Is there normally an upward transfer of storage foods from the roots or trunk to the growing shoots?** Amer. Jour. Bot. 7: 286–293. 1920.—See Bot. Absts. 6, Entry 1310.

1150. Daniel, Lucien. **Réactions antagonistiques et rôle du bourrelet chez les plantes greffées. [Antagonistic reactions and the rôle of the cushion (bourrelet) in grafted plants.]** Compt. Rend. Acad. Sci. Paris **170:** 285–287. 1920.—The anatomical modifications in the region of the graft are held to be due primarily to the cushion (bourrelet) developed at the union of stock and scion. This causes a diversion of conductive processes, altering the distribution of materials. Some substances are found to pass, others will not pass, and other substances are chemically changed before passage. Thus the biologic nature of the stock and scion is considered as changed. This tissue is also concerned in the development of all excrescences at this level, including roots of the scion, shoots of the stock and complex tissues in graft hybrids or chimeras when such occur.—*C. H. and W. K. Farr.*

1151. Duarte d'Oliveira, Jose. **Sur la transmission de la fasciation et de la dichotomie à la suite de la greffe de deux vignes portugaises. [The transmission of fasciation and dichotomous branching through the grafting of two Portuguese varieties of grapes.]** Compt. Rend. Acad. Sci. Paris **170:** 615, 616. 1920.—A scion of Albino de Souza, a variety of *Vitis vinifera*, which is never fasciated nor branches dichotomously was grafted to a stock of Goncalo Pires, another variety of the same species, which has fasciation and dichotomy as a permanent characteristic. Shoots of the scion developed later were found to be fasciated and dichotomous like those of the stock.—*C. H. and W. K. Farr.*

1152. Enfer, V. **Jardin fruitier d'amateur: Dispositions a observer pour la plantation. [The amateur fruit garden. Points to be observed in planting.]** Rev. Hortic. [Paris] **92:** 16–18. Jan., 1920.—General discussion on preparation of soil, transplanting, selection of types of trees to be planted, and care following planting.—*E. J. Kraus.*

1153. Florin, Carl and Rudolf. **"P. J. Bergius," en ny Applesort. ["P. J. Bergius," a new variety of apple.]** [Swedish] Acta Horti Bergiani [Stockholm] **6⁵:** 1–7. *Fig. 1. Pl. 1.* 1918.—A description and history of a new variety of apple, with beautiful crimson fruit.—*P. A. Rydberg.*

1154. Fries, Rob. E. **Strödda iaktagelser öfver Bergianska Trädgårdens gymnospermer. [Scattered observations concerning the gymnosperms in Hortus Bergianus.]** Acta Horti Bergiani [Stockholm] **6⁴:** 1–19. *1 pl.* 1919.—See Bot. Absts. 5, Entry 364.

1155. Gardner, V. R. **Results of bud selection investigations at the Missouri and Oregon experiment stations and their interpretation.** Proc. Amer. Soc. Hortic. Sci. **16:** 66–70 (1919). 1920.—Scions were taken in 1895, at the Missouri station from two bearing Ben Davis trees and from these other trees were propagated. One of the Ben Davis trees, from which the scions were taken, had been a heavy and regular producer of high grade fruit, while the other had been a light producer of fruit inferior in size and color. The crops resulting from these two groups of propagated trees were measured accurately. The author states, "The results of this particular experiment may be summarized by stating that the trees propagated from the poor parent were equal to those propagated from the good parent in productiveness, regularity of bearing and grade of fruit."—Another bud selection experiment was made at the Missouri station with strawberries. Runners were taken from the six most productive individuals in the station's plot of a standard variety. Records of yields were kept, and each year for ten years, plants from the highest yielding and low yielding plants were selected and fruited. Nothing was gained or lost by selection.—In 1913, at the Oregon station, plus and minus selections were made of four varieties of strawberries. Daughter plants were fruited in 1915, and for three succeeding generations, with the same results as found at the Missouri station. The low yielding Wilson mother plant was a poor plant maker. This characteristic was exhibited by each group of daughter plants throughout their life. At the same time as the above study, selections were made from productive and barren daughter plants of two station seedlings. The resulting records showed that the high yielding selections remained at least above the normal, while the selections from the barren plants continued to be nearly barren. In this case, a strain of strawberries, inferior to the normal was isolated. The author states, "From

a *practical* viewpoint, all bud selection could accomplish would be to keep the variety up to its own standard by the weeding out of an infertile or semi-barren strain."—The behavior of the runner propagated daughter plants of some strawberry seedlings were studied at the Oregon station, which gave evidence of degeneracy or "running out." Briefly, this took three forms: (a) A more or less complete loss of ability to produce fruit though vegetative vigor remained unimpaired. (b) A partial loss of ability to produce runners. (c) A marked reduction in vegetative vigor, resulting in weak degenerate plants. This degeneration may involve the entire stock of a variety, that is being grown under a given set of conditions or only a part of that stock.—In one case studied, plants from a certain seedling, which had apparently run-out at the end of the second season, were planted in a new location. Gradually they regained their vigor and yielded well, indicating that a degenerate strain may return to the normal, from which it sprang. The author also draws attention to the fact, that occasionally bud variation may furnish the starting point for real variety improvement. [See also Bot. Absts. 6, Entry 1673.]—*E. C. Auchter.*

1156. LEMÉE, E. **Chardon géant de Salonique. [A giant thistle from Salonica.]** Rev. Hortic. [Paris] 92: 8. Jan., 1920.—This species is regarded as a promising ornamental for large open spaces, since in the second year from seed the plants attained a height of 2.30 to 2.75 meters. Each bore approximately 40 flowerheads arising from, and symmetrically arranged about a main central stalk in the form of a pyramid. The purple flowers began to appear in early August, each persisted for 15 or 18 days, thus making a blooming period of about six weeks. The plants appear to be hardy without protection. The species has been identified as *Onopordon illyricum* Linné, var. *Carduncülus*, Boissier.—*E. J. Kraus.*

1157. LESOURD, F. **Les plantes potagères à travers les ages. [Culinary plants grown in various centuries.]** Rev. Hortic. [Paris] 92: 12–13. Jan., 1920.—A list of many species and varieties of plants arranged according to the general time of their introduction, from the fourteenth to the twentieth century inclusive.—*E. J. Kraus.*

1158. MORRIS, O. M. **Practical pruning as applied to apple and pear trees (Part One).** Better Fruit $14^6$: 3–5. Dec., 1919.—Practical and definite advice is given as to methods of procedure in pruning apple and pear trees. Both young and mature trees are considered.—*A. E. Murneek.*

1159. MORRIS, O. M. **Practical pruning as applied to apple and pear trees (Part two).** Better Fruit $14^7$: 7–10. Jan., 1920.—The season of pruning, pruning of different varieties of apples, treatment of pruning wounds, and repairing of injured trees are the topics considered in this part of the article.—*A. E. Murneek.*

1160. PEARCY, KNIGHT. **The cultivation of filberts in the Northwest.** Better Fruit $14^7$: 3–5. Jan., 1920.—This is a complete summary of the history and present status of filbert growing in the Northwest. Particular emphasis has been laid upon the commercial value of the following varieties: Barcelona, Du Chilly and Davidiana. Personal opinions of successful filbert growers are taken into account. The question of self-fertility and cross-pollination of the different varieties is considered in full.—*A. E. Murneek.*

1161. SCHIMPFF, WM. E. **Development of the cranberry industry in Oregon.** Better Fruit $14^8$: 7–9. Feb., 1920.—A complete and detailed account of the history and present status of the cranberry industry in the Northwest with special reference to the Cullaby Lake district in Oregon.—*A. E. Murneek.*

1162. SHAMEL, A. D. **Investigation with citrus fruits.** Proc. Amer. Soc. Hortic. Sci. 16: 70–76. (1919) 1920.—This paper gives a general idea of how the investigations in Citrus improvement have been carried on in California by members of the U. S. Dept. Agric. A survey of the citrus orchards was first made and favorably located orchards were selected in which to make the studies. Individual tree performance records were kept in the various

orchards, generally 100 trees in each orchard being used. A great many individual variations were found, some had to do with inferior fruit, some with growth habit of the trees, some with foliage, etc. Many strains of each of the citrus varieties studied were found. By these studies, the good and bad trees in different orchards were found. From the most productive trees, which usually were of the best strain, selections of parent trees, as sources of bud wood for propagation were made. As a rule, the extent of the occurrence of trees of the off-type strains increased with the numbers of bud generation from the original parent trees of the variety.—Under the old methods, buds were selected from vigorous growing, generally non-fruit-bearing wood, which generally came from the most vigorous and vegetative strains of trees, which were generally least productive and bore inferior fruit. At the present time, fruit bearing wood from productive trees are selected to get the bud wood and by this means this tendency toward the introduction of vegetative strains is being largely, if not wholly, overcome. The author states that experimental propagations have been made of all of the important bud variations studied in the course of the investigations and enough evidence has been secured from these propagations to warrant the statement that all of the important variations have been isolated through bud selection. He states, "The deisrable variations have been propagated and planted on an extensive commercial basis by citrus growers in Southern California so that at the present time there are thousands of acres of these trees available for study."—The author thinks that one of the most important results of the investigations has been the introduction of practical methods for keeping individual tree records in orchards. As a result of such records accurate knowledge has been obtained as to the effect of various pruning, cultural and fertilizer practices in crop yields, in addition to the bud selection studies.—*E. C. Auchter.*

1163. Tesnier, F. **Culture du Loganberry aux États-Unis. [Loganberry culture in the United States.]** [Rev. of: Darrow, G. M. **Culture of the Logan Blackberry.** U. S. Dept. Agric. Farmers Bull. 998. 1918.] Rev. Hortic. [Paris] 92: 14–16. *Fig. 3–4.* 1920.

1164. Vincent, C. C. **Results of pollination studies at Idaho University.** Better Fruit 14⁸: 11–15. *Tables 1–6.* Feb., 1920.—This is a summary of pollination studies with the apple as conducted at the Idaho Agric. Exp. Sta. during the seasons of 1911, 1912 and 1914. A majority of apple varieties were found to be practically self-sterile in Idaho. Methods of determination of self sterility in apples are discussed and the results of two, the paper bag and cloth tent methods, are compared. Self-fertilized fruits were found to contain fewer or no seeds at all, as compared with cross fertilized fruits. Further work showed that crosses of certain varieties gave better results than others; all varieties of apples will not cross indiscriminately with each other. Practical application of the results obtained is suggested.—*A. E. Murneek.*

## FLORICULTURE AND ORNAMENTAL HORTICULTURE

1165. Acosta, Celsa. **El Tararaco. [Amaryllis.]** Revist. Agric. Com. y Trab. 3: 56. *1 fig.* 1920.—A description of *Hippeastrum reginae* Linn. as a garden plant.

1166. Anonymous. **A Shakespearean garden.** Nature 104: 441–442. 1920.—See Bot. Absts. 6, Entry 1440.

1167. Laumonnier, Férard E. **Plantes de rocailles et plantes de bordures herbacées. [Plants for rockeries and herbaceous borders.]** Rev. Hortic. [Paris] 92: 19–20. Jan., 1920.—General statement urging more general planting of native and hardy species or varieties.—*E. J. Kraus.*

1168. McFarland, J. Horace. **Roses remade for America.** Garden Mag. 31: 93–98. April, 1920.—Mentions men who have done most to improve roses in America and discusses their work in connection with the varieties originated or improved by each.—*H. C. Thompson.*

1169. Mottet, S. **Les tulipes Darwin. [Darwin tulips.]** Rev. Hortic. [Paris] 92: 10–11. *1 pl. (colored).* Jan., 1920.—This class of tulips was first exhibited in France in 1889 by Kre-

lage and Sons, of Haarlem. Because of the large size, form, consistency, color, and keeping qualities of the flowers, the long stems on which they are borne, and the general hardiness of the plants, the several varieties are being widely planted by amateurs. Typically this class of tulips should be of solid color; the variegated forms should be classed as Rembrandts. Most of the varieties, however, are apt to become variegated in color under certain climatic conditions or if allowed to remain for some time without transplanting to a new soil. The more intense colors are least subject to change whereas the violets and lilacs are most likely to become modified.—*E. J. Kraus.*

1170. Pinelle, J. **Berberis Wilsonae Hemsley.** Rev. Hortic. [Paris] 92: 8–10. *2 fig.* Jan., 1920.—This species was introduced in 1904 by E. H. Wilson, from the mountains of Se Tchuen, western China. It is a beautiful shrub, scarcely more than a meter in height, hardy, interesting for its almost persistent foliage, becoming yellow-red in November and December, and its numerous coral red fruits which are conspicuous from October to severe cold weather. —*E. J. Kraus.*

1171. Wilson, E. H. **The romance of our trees VII. The Beeches.** Garden Mag. 31: 115–119. *4 fig.* 1920.—See Bot. Absts. 6, Entry 1471.

1172. Wilson, E. H. **The romance of our trees IX. Whence came the common fruits.** Garden Mag. 31: 259–263. 1920.—See Bot. Absts. 6, Entry 1472.

1173. Wilson, E. H. **The romance of our trees X. The Lombardy poplar and the Babylon willow.** Garden Mag. 31: 317–320. *5 fig.* 1920.

## VEGETABLE CULTURE

1174. Enfer, V. **Premiers semis de pois. [The first sowings of peas.]** Rev. Hortic. [Paris] 92: 20–21. Jan., 1920.—General directions are given regarding time of planting, preparation of soils, selection of varieties, and harvesting. With the approach of warm weather the vines are apt to become diseased. Copious watering and the application of copper sulfate (2 grams per litre of water) will aid in preventing this difficulty, but after April 1 it is preferable to sow varieties having wrinkled seeds since they will resist the bad effects of warm weather to a greater degree than will the round seeded types.—*E. J. Kraus.*

## HORTICULTURE PRODUCTS

1175. Baldasarre, Juan F. **Los usos del maní. [Uses of peanuts.]** Revist. Agric. Com. y Trab. 3: 20–22. *1 fig.* 1920.

1176. Cruess, W. V., A. W. Christie, and F. C. H. Flossfeder. **The evaporation of grapes.** California Agric. Exp. Sta. Bull. 322: 421–471. 1920.—Plans, cost, and general specifications of an evaporator of the horizontal tunnel air-blast type used successfully in the drying of grapes and prunes are given. Dipping of grapes in dilute boiling lye solution approximately doubled the rate of drying. No constant difference in yield could be found in sun-drying and evaporation. Unless heavily sulfured, dried grapes of 30 per cent or more moisture had poor keeping qualities. When dried, wine grapes could be seeded successfully but the loss during the process was excessively large.—*A. R. C. Haas.*

1177. Cruess, W. V. **Unfermented fruit juices.** California Agric. Exp. Sta. Circ. 220. *32 p.* 1920.—A full description of the methods and equipment necessary in the preparation of unfermented fruit juices.—*A. R. C. Haas.*

1178. Cruess, W. V. **Commercial production of grape syrup.** California Agric. Exp. Sta. Bull. 321: 401–416. 1920.—The method and the equipment necessary for the manufacture of grape syrup is described. The production of syrup from grapes presents a most promising method of profitably utilizing the crop of wine grapes in California.—*A. R. C. Haas.*

1179. Ventre, Jules. **Exploitation et utilization des marcs de raisins. [The utilization of grape pomace.]** Ann. Ecole Nation. Agric. Montpellier, 17: 1–70. *5 fig.* (July, 1918) July, 1919.—The utilization of grape pomace can be developed into a paying industry in the grape producing parts of France. Methods are given for extracting alcohol, tartaric acid and oil, and for utilizing the pomace as an animal feed and fertilizer.—*F. F. Halma.*

## MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

1180. Artschwager, Ernst F. **On the anatomy of Chenopodium album L.** Amer. Jour. Bot. 7: 252–260. *2 pl., 3 fig.* 1920.—Author reviews previous work on the anatomy of the Chenopodiaceae. In the species studied he finds that in very young stems there is a ring of collateral vascular bundles; but a periodically active extrafascicular cambium soon develops outside of these, which lays down xylem and conjunctive tissue centripetally and, in restricted regions, lays down phloem centrifugally. The xylem of a bundle is usually all produced before any of its phloem develops. Where phloem arises the cambium is "used up" and disappears. The continuity of the cambium ring is maintained, however, by the progressive formation of new cambium outside the phloem group. An island of intraxylary phloem is thus produced, and as a result the vascular ring consists of successive series of xylem bundles and islands of intraxylary phloem, the whole embedded in a mass of lignified conjunctive tissue. That part of the conjunctive tissue which extends radially between the bundles may function as ray tissue though it is not such morphologically. Contrary to the results of previous workers, the author finds the chief element of the phloem to be the sieve tube and its companion cell, phloem parenchmya being of only secondary importance. The ontogeny of the stem structure of this species shows a striking similarity to the structure of the root of the sugar beet.—*E. W. Sinnott.*

1181. Carano, E. **Nuovo contributo alla embriologia delle Asteraceae. [Contribution to the embryology of the Asteraceae.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^1$: 412–415. 1919.—A microscopical examination of the flowers of *Erigeron Karvinskianus* var. *mucronatus* shows that the flowers have no need of pollination to mature achenes and that this species may be apogamic. The nuclear phenomena are described.—*F. M. Blodgett.*

1182. Daniel, Lucien. **Réactions antagonistiques et rôle du bourrelet chez les plantes greffées. [Antagonistic reactions and the rôle of the cushion (bourrelet) in grafted plants.]** Compt. Rend. Acad. Sci. Paris 170: 285–287. 1920.—See Bot. Absts. 6, Entry 1150.

1183. Holm, Theo. **Internal glandular hairs in Dryopteris.** Rhodora 22: 89–90. *2 fig.* 1920.—An account of the occurrence of these structures in the intercellular spaces of the leaf parenchyma in *Dryopteris Filix mas* (L.) Schott, *D. marginalis* (L.) Gray, *D. spinulosa* (O. F. Mull.) Kuntze, and *D. cristata* (L.) Gray. An examination of other species of this genus and also of other genera failed to disclose similar structures and the writer suggests that their presence in some species and absence in others might indicate some generic distinction.—*James P. Poole.*

1184. Loeb, J. **The nature of the directive influence of gravity on the arrangement of organs in regeneration.** Jour. Gen. Physiol. 2: 373–386. 1920.—See Bot. Absts. 6, Entry 1354.

1185. Souèges, R. **Embryogénie des Chénopodiacées. Développement de l'embryon chez le Chenopodium Bonus-Henricus L. [Embryogeny of the Chenopodiaceae. Development of the embryo of Chenopodium Bonus-Henricus L.]** Compt. Rend. Acad. Sci. Paris 170: 467–469. 1920.—The fertilized egg by two successive divisions gives rise to a row of four cells, each of which divides to form a distinct portion of the mature embryo. This early differentiation is unlike the condition found in the Polygonaceae, as is also the origin of the hypophysis from

the hypobasal cell of the four-celled stage. The Chenopodiaceae agree with the Polygonaceae, however, in that the basal cell of the two-celled stage contributes to the hypocotyl, and in that the cortex initials arise in the tissue produced from the hypobasal cell of the tetrad stage. —*C. H. and W. K. Farr.*

1186. ULEHLA, VLADIMIR. **Studien zur Lösung des Windesproblems. [Wind problems.]** Bot. Notiser [Lund] 1920: 1–30. 1920.

1187. WELLS, B. W. **(Note without title.)** Plant World 22: 251–252. *2 fig.* 1919.—An abnormal inflorescence of *Allium mutabile* is described. Certain stamen primordia had developed flowers instead of stamens. It is suggested that the peculiar development may give a clue to the development of the compound umbel as a type of inflorescence.—*Charles A. Shull.*

1188. WELLS, B. W. **Early stages in the development of certain Pachypsylla galls on Celtis.** Amer. Jour. Bot. 7: 275–285. *1 pl.* 1920.—The galls produced on leaves of species of *Celtis* by *Pachypsylla mamma* and *P. asteriscus* were studied. The life history of the insects is briefly outlined and the histological phenomena accompanying gall formation described. The newly hatched nymph inserts its proboscis into the upper side of the leaf and remains in this position during gall formation. A thin sheath is laid down around the seta by the cytoplasm of the cells which it penetrates. Through hypertrophy of the epidermis and mesophyll cells on the opposite (lower) side of the leaf, a downward evagination is produced which lowers the insect into the body of the leaf. A "cover-cone" now springs up on the upper surface from tissue adjacent to the larva and rapidly grows over the insect, enclosing it in the gall. Chloroplasts degenerate and nuclei increase in size in the zone below the larva. Multinucleate cells appear in the tissues of the floor of the larval chamber, and the author believes their nuclei to arise amitotically. The grand period of growth for the gall is early in its existence, while that for the larva itself does not come until the gall is more than half grown. No clue was obtained as to the nature of the stimulus which causes the development of these very specific gall structures.—*E. W. Sinnott.*

## MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

1189. ANDERSON, EMMA N., AND EDNA R. WALKER. **An ecological study of the algae of some sandhill lakes.** Trans. Amer. Microsc. Soc. 38: 51–84. *Pl. 3–12, 17 fig.* 1920.

1190. BUTTERFIELD, W. M. **A vegetable manufacturer of decorated glass.** Sci. Amer. 122: 116, 122–124. *1 fig.* 1920.—Description of diatoms in popular style.—*Chas. H. Otis.*

1191. CARTER, NELLIE. **Studies on the chloroplastids of Desmids III. X. The chloroplasts of Cosmarium.** Ann. Botany 34: 265–286. *Pl. 10–13, 88 fig.* 1920.—Most of the species of Cosmarium examined have axile chloroplasts in each semicell; in a few the chloroplasts are parietal. The number of pyrenoids depends upon the individual, and at any time a group of pyrenoids may be formed where originally there was only one.—*E. N. Transeau.*

1192. CHODAT, R. **Sur un Glaucocystis et sa position systematique. [Concerning Glaucocystis and its systematic position.]** Bull. Soc. Bot. Genève 11: 42–49. *2 fig.* 1919.—From a careful study of the life history of a species of *Glaucocystis* the genus is placed in a new family of *Dinoflagellateae*. The new family *Glaucocystaceae* has the following characteristics: the cellulose membrane has internal polar thickenings; a large nucleus with a nucleolus, chromatophores strap-shaped and peripheral in distribution or arranged in two radiating groups with a clear space on one side of the cell between the two groups of chromatophores which makes the cells asymmetrical. Multiplication takes place as in *Oocystis*. The plants are abundant on mosses and *Equisetum* growing in small streams.—*W. H. Emig.*

1193. Coker, W. C. **A parasitic blue-green alga.** Jour. Elisha Mitchell Sci. Soc. 35: 9. 1919.—See Bot. Absts. 5, Entry 2026.

1194. Ducellier, F. **Deux Desmidiacees nouvelles. [Two new Desmids.]** Bull. Soc. Bot. Genève 11: 117-121. *2 fig.* 1919.—*Docidium undulatum* Bail. var. *bisannicum* n. var. and *Cosmarium benedictum* n. sp. were found in Switzerland.—*W. H. Emig.*

1195. Du Rietz, Einar. **Studier öfver de skandinaviska Laminaria-arterna. [Studies of the Scandinavian species of Laminaria.]** [Swedish.] Bot. Notiser [Lund] 1920: 41-49. 1920. —The author admits 6 species of *Laminaria* recorded for Scandinavia, belonging to two distinct groups. The first group contains only *L. sacharina* (L.) Lamour., which he dismisses with the remark that "he has nothing of importance to communicate." Of the second group, *L. nigripes* J. G. Agardh and *L. gunneri* Foslie have been found only on the northern coast of Norway, the first only as thrown up on the beach and very doubtfully Scandinavian. The second, the author had not had any chance to study. There were, therefore, only three left to be extensively treated: 1. **L. scoparia** (Ström) Du Rietz, nov. comb. [*L. hyperborea* (Gunner) Foslie; *L. digitata* (L.) Lamour.]; 2. **L. digitata** (Huds.) Edm. [*L. flexicaulis* LeJolis]; and 3. **L. cucullata** (LeJolis) Foslie.—*P. A. Rydberg.*

1196. F., H. [Rev. of: Gepp, A., E. S. Gepp, and Mme. Paul Lemoine. **Marine algae.** (Melobesiae by Mme. Lemoine.) Botany, Part II. In British Antarctic ("Terra Nova") Expedition, 1910. Nat. Hist. Report. P. 17-28. No date.] New Zealand Jour. Sci. Tech. 1: 251. July, 1918.—Records one new species, *Melobesia Geppii* Lemoine, which was collected at Spirits Bay, North Cape. Of nine other seaweeds collected the specimens were so fragmentary that they cannot be given specific rank until more and better material becomes available. —*C. S. Gager.*

1197. G., A. [Rev. of: Church, A. H. **Thalassiophyta and the subaerial transmigration.** Botanical Memoirs, No. 3. Oxford University Press. *95 p.* 1919.] Jour. Botany 58: 59-61. 1920.

1198. Gard, Mederic. **Division chez Euglena limosa Gard. [The cell-division of Euglena limosa Gard.]** Compt. Rend. Acad. Sci. Paris 170: 291-292. 1920.—See Bot. Absts. 6, Entry 989.

1199. Mangin, L. **Sur les Chaetoceras du group Peruvianus Bgtw. [On the species of Chaetoceras of the group Peruvianus Bgtw.]** Bull. Mus. Hist. Nat. Paris 25: 305-310, 411-414. 1919.—The author compares critically the various species of long-horned Diatoms of this group previously published and recognizes 5 species and 1 form which he groups in two series designated as *convexicornes* and *concavicornes*. A new name and a new combination are proposed as follows: *C. convexicornis* (*C. peruvianus* Gran.) and *C. concavicornis* Mangin forma *currens* (*C. currens* Clève). The several species are illustrated by line drawings.—*E. B. Payson.*

1200. Penard. **Mallomonas insignis spec. nova?** Bull. Soc. Bot. Genève 11: 122-128. *1 fig.* 1919.—Many specimens of *Mallomonas* were obtained at all seasons of the year in swamps. The plants are considered either a new species or a European form of the American species *M. pulcherrima.*—*W. H. Emig.*

1201. Playfair, G. I. **New ane rare freshwater algae.** Proc. Linnean Soc. New South Wales 43: 497-543. *Pl. 54-58, 11 fig.* 1918.—These notes cover new and rare Australian forms, 66 of which are described and figured.—*Eloise Gerry.*

1202. Taylor, Fred B. **Diatoms. New genera and species.** Trans. Amer. Microsc. Soc. 38: 283-290. 1919.—The catalogues of diatoms and the books and monographs which have recently appeared on the subject are briefly discussed. The suggestions of Cleve and others for new genera are given. A list of 42 new genera with descriptions and citations is given.—*S. H. Essary.*

1203. Teodoresco, Em. C. **Sur la presence d'une phycoérythrine dans le Nostoc commune. [On the presence of a phycoerythrin in Nostoc commune.]** Rev. Gèn. Bot. 32: 145–160. *Pl. 2, fig. 4.* 1920.—See Bot. Absts. 6, Entry 844.

1204. Yendo, Kichisaburo. **Novae Algae Japoniae. Decas I–III. [New Japanese Algae. Decades I–III.]** Bot. Mag. Tokyo 34: 1–12. 1920.—The following new species, varieties and forms of marine algae are described: *Cladophoropsis coriacea, Chaetomorpha Chelonum* Collins var. *Japonica, Myriocladia Kuromo, Haliseris evanescens, Spathoglossum pacificum, Laminaria amakusaensis, Myriactis Sargassi, Wildemania Tasa, Chondrus nipponicus, Chondrus giganteus, Gymnogongrus catenatus, Phyllophora japonica, Endocladia Yasudae, Trematocarpus pygmaeus, Lomentaria hakodatensis, Chylocladia lubrica, Symphyocladia latissima, Polysiphonia hakodatensis, Pterosiphonia pumila, Dasyphila plumarioides, Euzoniella ocellata, Wrightiella loochooensis, Heterosiphonia japonica, Heterosiphonia coccinia* Fkbg. forms *pacifica* and *nipponica, Ceramium Kondoi, Grateloupia catenata, G. jubata, G. kaifuensis, G. ? nipponica, Nemastoma Nakamurae* and var. *membranacea, Hildenbrandtia yessoensis.* —*Roxana Stinchfield Ferris.*

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1205. Andrews, A. LeRoy. [Rev. of: Herzog, T. **Die Bryophyten meiner zweiten Reise durch Bolivia. (Bryophytes of second Bolivian trip.)** Bibliotheca Botanica 87. 1916.] Bryologist 23: 9–10. 1920.—The reviewer questions the author's tendency toward the multiplication of new species and notes the slight value of the connection claimed to exist between Bolivian and Mexican floras. The general phytogeographical discussions of the volume are commended.—*Edward B. Chamberlain.*

1206. Bryan, Geo. S. **Early stages in the development of the sporophyte of Sphagnum subsecundum.** Amer. Jour. Bot. 7: 296–303. *26 fig.* 1920.—Author reports the results of his study of the young sporophyte dissected out from the venter of the archegonium. The fertilized egg divides by a horizontal wall into two approximately equal cells, and a filament of from 6 to 7 cells is usually formed before any longitudinal divisions occur. The division wall in the 2-celled stage could not be traced with certainty in the older stages. Apical growth probably occurs in the development of the young sporophyte. If the walls appear in regular order, a long, slender type of sporophyte is produced; if in irregular order, a shorter, bulbous type. The number of primary segments (formed by walls transverse to the axis of the archegonium) has not been found to exceed 12. In a considerable number of cases disintegration begins at the apical portion of the very young sporophyte and proceeds for some distance basipetally. The early development of the sporophyte of *Sphagnum* shows a greater similarity to that of the Jungermanniales than to any other group of the Bryophyta.—*E. W. Sinnott.*

1207. Familler, Ignaz. **Die Lebermoose Bayerns. Zweiter (beschreibender) Teil. [The Hepaticae of Bavaria. Second (descriptive) part.]** Denkschr. Bayerischen Bot. Ges. Regensburg 14: 1–167. *27 pl., 11 fig.* 1920.—The first part of this comprehensive work on the Hepaticae of Bavaria was published in 1917 (Denkschr. Bayer. Bot. Ges. Regensburg 13: 153–304. *5 fig.*) and consisted of a compilation of the known stations for the various species. The second part describes the species in considerable detail from independent observations, giving a general idea of their habitats and of their distribution in Bavaria. Keys to the genera and species are interpolated throughout, and every species is illustrated by one or more photomicrographs, supplemented in a few cases by line drawings to bring out significant features. In all 57 genera and 164 species are recognized, 22 species belonging to the Marchantiales, 139 to the Jungermanniales, and 3 to the Anthocerotales. These relatively low numbers are due to the author's broad conceptions of specific limitations. Instead of dividing a series of closely related plants into species of subordinate rank, he defines the entire series as a

single comprehensive species, under which he frequently distinguishes subspecies, varieties and forms. In many cases these subspecies, varieties and even forms are recognized as distinct species by other writers, the following subspecies for example belonging to this category: *Pellia epiphylla* subsp. *Neesiana*; *Lophozia ventricosa* subspp. *guttulata* (Lindb. & Arn.), *longidens* (Lindb.), *confertifolia* (Schiffn.), and *longiflora* (Nees); *L. alpestris* subsp. *Wenzelii* (Nees); *Scapania curta* subsp. *helvetica* (Gottsche); *S. dentata* subsp. *undulata* (L.); *S. aequiloba* subsp. *aspera* (Bernet); and *Anthoceros punctatus* subsp. *Husnoti* (Steph.). All of these subspecies, an occasional variety, and the majority of the forms recognized by the author represent new combinations (in the nomenclatorial sense), although this is not indicated in any way. The work is designed primarily for beginners but will be of value to all students of the Hepaticae.—*A. W. Evans.*

1208. Monckton, Horace W. **The flora of the Bagshot District.** Jour. Botany **57**: 251–257. 1919.—See Bot. Absts. 4, Entry 1747.

1209. Pottier, Jacques. **Sur la généralité de l'asymétrie foliaire chez les mousses. The occurrence of foliar asymmetry in the mosses.]** Compt. Rend. Acad. Sci. Paris **170**: 471–474. *7 fig.* 1920.—A study of sections of leaves of *Leucobryum vulgare* shows that the dorsal side of the leaf develops more rapidly than the ventral, the leaves thus becoming unsymmetrical.—*C. H. and W. K. Farr.*

1210. Rickett, H. W. **The development of the thallus of Sphaerocarpos Donnellii Aust.** Amer. Jour. Bot. **7**: 182–194. *4 pl., 1 fig.* 1920.—The author discusses briefly the somewhat conflicting views of previous students of this genus. In the species studied by him, he finds that the spore germinates by a slender germ tube, the details as to the formation of which are very variable. On the end of this tube and at right angles to it a germinal disc is formed by the activity of all the terminal cells of the tube, rather than by a single apical cell. This disc develops into the thallus of the mature plant. Apical growth of the thallus is due to a group of four-sided cells at the apical notch, although the author suggests the possibility that but one apical cell may sometimes be present. The dorsal and ventral segments of these apical cells add to the thickness of the thallus in the median portion. The lateral segments produce the marginal lobes. Under natural conditions, these lobes are merged into a more or less continuous rim. Under cultural conditions, the more rapid elongation of the median portion of the thallus results instead in the production of distinct leaf-like lobes. Branching of the thallus is due to a division of the apical group of cells into two such groups, a lobe occupying the region between. The formation of lobes is not necessarily related to branching. A detailed account of the history of two typical plants is presented.—*E. W. Sinnott.*

1211. Warnstorf, C. **Bemerkungen über einige Formen von Polytrichum und ihre Rippenlamellen auf der Oberfläche der Blatter. [Observations on several forms of Polytrichum and their leaf surface lamellae.]** Hedwigia **61**: 409–411. 1920.—Several forms of *Polytrichum attenuatum* Menz. are noted, and a difference is demonstrated between the surface lamellae of *P. decipiens* Limpr. and *P. ohioense* Ren. & Card. The author suggests a division of the genus *Polytrichum* into four groups based on lamella characters. The following species and varieties are described as new: *P. attenuatum* var. *longifolium* and *P. decipiens* var. *strictifolium* from Germany; *P. vaginatum* from Greenland.—*R. S. Nanz.*

1212. Warnstorf, C. **Über die vegetative Vermehrung einiger Laubmoose aus Bolivia. [The vegetative reproduction of several mosses from Bolivia.]** Hedwigia **61**: 412–417. 1920.—The author describes a method of vegetative reproduction by means of leaf fragmentation in *Prionodon luteovirens* (Tayl.) Mitt., *Tortula aculeata* Wils., *Bartramia fragilifolia* C. Mull., and *Leiomela deciduifolia* Herzog. The last-named species also propagates itself by fragmentation of stems and branches.—*R. S. Nanz.*

# MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

## FUNGI

1213. ADAMS, J. F. **Rusts on conifers in Pennsylvania.** Pennsylvania Agric. Exp. Sta. Bull. 160. *30 p., 10 fig.* 1920.—A brief characterization of the coniferous rusts, an enumeration of the species known to occur in the State, citations of collections with collectors names, and an index to species and hosts. The list is composed of *Peridermium Comptoniae, P. pyriforme, P. cerebrum, P. strobi,* on stems of *Pinus* spp.; *P. acicolum, P. delicatulum, P. carneum, P. Helianthi, P. Ipomoea,* on leaves of *Pinus* spp.; *P. Peckii, P. Hydrangeae,* on leaves of *Tsuga; P. columnare* on leaves of *Abies; Caeoma Abietis-canadensis* on twigs and cones of *Tsuga; Gymnosporangium Juniperi-virginianae, G. globosum, G. germinale, G. effusum, G. Nidus-avis, G. clavariaeforme, G. botryapites, G. trachysorum,* on *Juniperus* spp., and six other rusts which have been collected only in the uredinial or telial stages.—*C. R. Orton.*

1214. ADAMS, J. F. **Sexual fusions and development of the sexual organs in the Peridermiums.** Pennsylvania Agric. Exp. Sta. Bull. 160: 31–76. *5 pl.* 1920.—"Sexual cell fusions and development of the aecium were studied in five species of Peridermium, *P. Comptoniae, P. pyriforme, P. acicolum, P. Peckii* and *P. balsameum.* In the two stem forms studied (*P. Comptoniae* and *P. pyriforme*) the pycnia have a caeomoid type of fructification, being apparently unlimited in their development. These caeomoid pycnia originate between the cork layer and cortical parenchyma and thus are to be considered cortical in origin and not sub-epidermal. They are irregular in outline and the margins are not delimited, but consist of a spreading plectenchyma. The pycnial layer appears as a broad, flat crust-like layer with no definite aperture for the escape of the pycniospores which apparently depend for their escape upon the irregular cracking of the overlying tissue. They were observed developing in the tissue overlying the young aecia as well as in the adjacent tissue. The pycnia in the leaf forms are early delimited. They are conoidal to hemispherical in outline and possess a definite aperture for the escape of the pycniospores. The gametophoric hyphae form a conspicuous palisade layer in the aecial primordia of *P. Comptoniae, P. pyriforme,* and *P. acicolum.* The pseudoparenchyma of the aecial primordia is made up of the peripheral portions (sterile cells) of the gametophoric hyphae and is sharply defined from the fertile layer. The sterile cells of the gametophoric hyphae are homologous to the so-called "buffer cells" of the caeoma. Sexual cell fusions occur between adjacent fertile cells of similar size and position in two gametophoric hyphae. A dissolution of the walls occurs usually at the upper ends or where they come in contact. This phenomenon proceeds so as to result ultimately in the complete disappearance of the contact walls, thus forming a fusion cell. The development of a peridium appears to be associated in these forms with an extensive development of pseudoparenchyma. The central arch of the peridium is composed of the apical metamorphosed aeciospores of the inner spore chains. An exception is found in the aecium of *P. acicolum* where the division of the peridial initial cells in the central arch cuts off an intercalary cell above. The lateral portion of the peridium consists entirely of metamorphosed spores. In *P. Comptoniae* the central arch of the peridium is two to four cells in thickness. The size of the aecium in *P. acicolum, P. Peckii* and *P. balsameum* is early determined by the breadth of the primordium. The aecia of *P. Comptoniae* and *P. pyriforme* resemble the caeoma in their indeterminate growth and the aecidium cup in their deep origin and the presence of a peridium. In *P. Comptoniae* and *P. pyriforme* the effect of the development of the pycnia and aecia is such as to kill the immediately adjacent tissue. This tissue is sloughed off in the late summer with the formation of a new cork layer."—*C. R. Orton.*

1215. BEZSSONOFF, [—.] **Sur l'obtention experimentale de la sexualite chez les champignons et orientee sur la structure typique du plasma sexuel.** [On the initiation of sexual repro-

**duction in fungi by experimental means, and the existence of a cytoplasmic structure peculiar to the sexual process.]** Compt. Rend. Acad. Sci. Paris 170: 288–290. 1920.—See Bot. Absts. 6, Entry 1344.

1216. Fairman, Charles E. **The ascomycetous fungi of human excreta.** *11 p., 3 fig., 1 pl.* Lyndonville, New York, 1920.—A privately published pamphlet prepared for the information of the medical profession. The occurrence of a species of Fusarium is noted, and a species of Cylindrocolla is described as new under the name *C. faecalis*. Brief mention is made of the more commonly known fungous parasites of man, and a synopsis is given of those Ascomycetes which have been found in human tissues or excreta. A bibliography is appended. —*H. M. Fitzpatrick.*

1217. Fitzpatrick, Harry Morton. **Monograph of the Coryneliaceae.** Mycologia 12: 206–237. *Pl. 12–18.* 1920.—Author believes it best to consider the Coryneliaceae under the Perisporiales and close to the Perisporiaceae rather than under the Sphaeriales. Interrelationships of species are discussed and a chart is presented showing author's conception of the evolution within the family. The family is described and a key to the genera is included. These are *Caliciopsis*, *Sorica*, *Corynelia*, and *Tripospora*. *Coryneliella* is excluded. Each genus is described, its relationships are discussed, and a key is given to the species. Three species are recognized and fully described in the genus *Caliciopsis* and two new combinations are made: *C. calicioides* (Fries) and *C. subcorticalis* (Cooke and Ellis). In the genera *Sorica* and *Tripospora* one species is recognized and described in each genus. The genus *Corynelia* is to be described in the next number, but species of this genus as well as all the species in the other general are here clearly illustrated by means of photographs and drawings.—*H. R. Rosen.*

1218. Fragoso, D. Romualdo Gonzalez. **Datos para la Deuteromicetologia Catalana. [Data on the fungi imperfecti of Catalonia.]** Mem. R. Acad. Cien. y Artes [Barcelona] III, 15: 429–467. *Illustrated.* 1920.—A large number of species of the fungi imperfecti were collected in the province of Catalonia in northeastern Spain. Twenty-four species and several varieties are described as new.—*L. L. Harter.*

1219. Hedgcock, George G., N. Rex Hunt, and Glenn G. Hahn. **New species and relationships in the genus Coleosporium.** Mycologia 12: 182–198. 1920.—A *Peridermium* on needles of *Pinus caribaea*, *P. palustris* and *P. taeda* was found in close association with plants of *Amsonia ciliata* bearing uredinia of *Coleosporium apocynaceum*. Inoculations with aeciospores were successful, uredinia and telia being produced on *Amsonia*. A new combination is made and described: *Peridermium apocynaceum* (Cooke) Hedgc. & Hunt. Infection experiments, using aeciospores indicates that *Peridermium fragile* Hedgc. & Hunt is the aecial stage of *Coleosporium laciniariae* Arthur. This species ranges from New Jersey to Florida and Arkansas. As a result of successful inoculations with aeciospores of *Peridermium minutum* Hedgc. & Hunt on *Adelia ligustrina*, with the production of uredinia and telia, the alternate host for this *Peridermium* is established and the new combination *Coleosporium minutum* Hedgc. & Hunt is made and described. Numerous infection experiments as well as morphological differences indicate that *Coleosporium elephantopodus* (Schw.) Thum. and *C. carneum* (Bosc) Jackson are different species. The new combination *Peridermium elephantopodis* (Schw.) Hedgc. & Hahn is made and described "to distinguish it from other species of the form genus *Peridermium*." Eleven species of *Pinus* are listed as aecial hosts and four species of *Elephantopus* as uredial and telial hosts of *Coleosporium elephantopodis*. *Peridermium carneum* (Bosc) Seym. & Earle is redescribed; fourteen species of *Pinus* and fourteen species of *Vernonia* together with localities are listed under *Coleosporium carneum*. A new leaf *Peridermium*, *P. floridanum*, Hedgc. & Hahn, is described on *Pinus palustris* collected near Ocala, Florida. *Peridermium intermedium* Am. Auct. appears to be a mixture of two species, *P. carneum* and *P. elephantopodis*. Seven species of *Peridermium* are listed as occurring on *Pinus echinata*. Notes are presented on the period of fruiting of leaf Peridermiums on pine. Eleven new pine hosts of various species of *Coleosporium* are listed, and thirteen new

uredinial and telial hosts of various genera including *C. ribicola* on *Grossularia cynosbati* from Wisconsin, and on *G. innominata* and *G. reclinata* from District of Columbia.—*H. R. Rosen.*

1220. LINGELSHEIM, A. **Über "steinreizker" in Schlesien. ["Steinreizker" in Silesia.]** Hedwigia 61: 380–382. 1920.—*Verticillium silesiacum* n. sp. is described as the conidial stage of *Hypomyces lateritius.* The specimen was found on the market in Frankenstein as a parasite of *Lactaria theiogola.* The name is suggested by the hardness of the hypertrophied tissue as compared with tissue affected with *Hypomyces ochraceus* (*V. agaricinum*). Mycelium of *V. silesiacum* is yellow and the conidia measure $18 \times 7\mu$.—*Verticillium niveostratosum* Lindau on *Fuligo septica* and *Stemonitis fusca* probably is identical with the conidial stage of *Hypomyces violaceus.*—*D. Reddick.*

1221. LOUBIÈRE, A. **Sur la flore fongique du fromage de Brie. [The fungal flora of de Brie cheese.]** Compt. Rend. Acad. Sci. Paris 170: 336–339. *2 fig.* 1920.—In addition to species of *Penicillium* the fungi present in the order of their frequency are *Fusarium sarochroum* Desm., *Geotrichum candidum* Link, *Trichosporium* sp., *Botryotrichum piluliferum* Sacc. & March, *Hormodendron cladosporioides* (Fresen.) Sacc., *Gymnoascus luteus* Zuk., *Lasiobotrys* sp. Reproduction of *Trichosporium* by chlamydospores and conidia is described, as is also the formation of conidiophores and arthrospores in *Hormodendron.*—*C. H. and W. K. Farr.*

1222. RIDDLE, LINCOLN W. **Observations on the genus Acrospermum.** Mycologia 12: 175–181. *Pl. 11.* 1920.—Since the fruiting body appears to be a perithecium the author follows Ellis in placing the genus under the Hypocreales rather than under the Hysteriales. Variations of *Acrospermum compressum* are noted; *A. graminum* Libert and *A. foliicolum* Berk. are considered as varieties of it, the latter as var. *foliicolum* (Berk.) Riddle comb. nov. *Acrospermum Maxoni* Farlow is described as a new species occurring on the underside of living fronds of *Polypodium induens* and *P. cretatum.* *Acrospermum corrugatum* Ellis and *A. fultum* Harnkess are said to be the same species and "is identical with the long known but comparatively rare European species: *Lophium dolabriforme* Wallr."—*H. R. Rosen.*

1223. SACCARDO, P. A. **Notae mycologicae, ser. XXIX—Micromycetes Dakotenses et Utahensis a Doct. J. F. Brenckle lecti et communicati. [Fungi of Dakota and Utah collected by J. F. Brenckle.]** Mycologia 12: 199–205. 1920.—Twenty-five perfect and eight imperfect fungi are listed, some with brief descriptive notes. One new genus and several new species are described: *Rosellinia subsimilis* Sacc. sp. nov., *Phaeotrype* Sacc. gen. nov., *P. Brencklei* Sacc. sp. nov., *Diatrype paurospora* Sacc. sp. nov., *Chorostate utahensis* Sacc. sp. nov., *Diaporthe* (Euporthe) *Brenckleana* Sacc. sp. nov., *Lachnum crystalligerum* Sacc. sp. nov., *Patinella Brenckleana* Sacc. sp. nov., *Septoria Lunelliana* Sacc. sp. nov., *Melanconium botryosum* Sacc. sp. nov., *Steganosporium utahense* Sacc. sp. nov.—*H. R. Rosen.*

1224. SARTORY, A. **Sur un champignon nouveau du genre Aspergillus isolé dans un cas d'onychomycose. [A new fungus of the genus Aspergillus isolated from a case of onychomycosis.]** Compt. Rend. Acad. Sci. Paris 170: 523, 534. 1920.—*C. H. and W. K. Farr.*

1225. VAN OVEREEM, C. **Beiträge zur Kenntnis einiger Helotiaceen. [Contribution to a knowledge of the Helotiaceae.]** Hedwigia 61: 383–389. *Pl. 4, 2 fig.* 1920.—Critical discussions with extended descriptions from an abundance of material of the following: *Gorgoniceps aridula, Helotium sulphurinum, H. pallescens.* *Rutstroemia firma* has 3 types of asexual spores Verticillium-like, Oidium-like and conidia formed at the ends of the ascospores. *Ciboria rhizophila* is new to the Dutch flora.—*Helotium virgultorum* is exceedingly variable in form, depending on conditions of growth, and the two varieties of Rehm, *salicinum* and *fructigenum* are wholly unwarranted.—*D. Reddick.*

1226. VAN OVEREEM, C. **Über zwei wenig bekannte Schmarotzer von Discomyceten. [Two little-known parasites of discomycetes.]** Hedwigia 61: 375–379. *1 fig.* 1920.—*Stephanoma strigosum* Wallr. and *Sepedonium simplex* Cda. were found on *Lachnea hemisphaerica*

in Holland. The Verticillium stage of *S. strigosum* appears first as a covering on the hymenium of the host. This is replaced by a layer of chlamydospores which has practically the same color as the normal hymenium. The spores of the host remain an unrecognizable mass. The disease was very abundant in Holland in 1918.—*Sepedonium simplex* attacks the entire apothecium but produces its spores on the surface of the hymenium. The spores are borne somewhat like those of *Verticillium.* This stage has been called *Fusisporium fungicolum* by Corda. Chlamydospores follow and these are colored, first red then yellowish brown. A new diagnosis, following suggestions of Lindau, of *Sepedonium simplex* (Corda) Lindau, is presented.—The parasite was found on *Macropodium macropus* and on *Lachnea hemisphaerica* and has been reported on other discomycetes.—*D. Reddick.*

1227. VUILLEMIN, P. **Revue de mycologie. Première partie: Mycologie pure. [Review of mycological literature. Part I: Pure mycology.]** Rev. Gén. Sci. Pures et Appliquées, **31:** 148–156. 1920.—In this review the author summarizes the work of many authors, *first* on the cytology of the Basidiomycetes, in which observations on cell and nuclear fusions are reported and from which inferences as to changes in classification are drawn: *second* on the relation of nuclear evolution and behavior to sexuality: *third* on the anatomy of the Basidiomycetes at various stages in growth and development: *fourth* similarly on the anatomy of the Ascomycetes with the effect of these studies on classification in each group: *fifth* on the reports of new species in all parts of the world.—*G. J. Peirce.*

1228. VUILLEMIN, P. **Revue de mycologie. Deuxieme partie: Mycologie appliquée. [Review of mycological literature. Part II: Applied mycology.]** Rev. Gén. Sci. Pures et Appliquées **31:** 177–186. 1920.—Reviews in the field of applied mycology, the more recent publications on fungi under the headings (1) poisoning by fungi, (2) fungous parasites of man, (3) fungous parasites of invertebrate animals, (4) fungous parasites of plants. Of these last he considers A—Phycomycetes, B—Uredineae and Ustilagineae, C—Basidiomycetes, D—Ascomycetes and Fungi imperfecti. One is impressed with the very considerable number of American papers included.—*G. J. Peirce.*

1229. VUILLEMIN, PAUL. **Remarques sur un champignon rapporté par M. Loubiere au genre Trichosporium. [Remarks on the fungus reported by Loubiere as belonging to the genus Trichosporium.]** Compt. Rend. Acad. Sci. Paris **170:** 554, 555. 1920.—The author questions the justification for placing the fungus described by Loubiere as occurring in deBrie cheese in the genus *Trichosporium.* It resembles in many ways species of *Harziella* but is excluded from that group on account of the absence of mucilage.—*C. H. and W. K. Farr.*

## LICHENS

1230. ANDERS, JOSEF. **Die Strauch- und Blattflechten Nordböhmens. 2 Nachtrag. [The fruticose and foliose lichens of northern Bohemia. 2.]** Hedwigia **61:** 351–374. 1920.—Geologic formations are described in some detail. Information from Katzer's *Geology of Bohemia.* Lichen flora is very rich. Particularly interesting conditions are found in some of the railroad cuts. List includes *Cladonia,* 37 species, *Stereocaulon nanum, Peltigera erumpens, Parmelia,* 7 species, *Parmeliopsis,* 2 species, *Cetraria,* 7 species, *Letharia vulpina, Gyrophora vellea* and *flocculosa, Physcia dubia. Cetratia bohemica* is new; several new forms are described. Many of the species are new to Bohemia. Synonomy, stations, and exsiccati are mentioned and there are critical notes on many species.—*D. Reddick.*

1231. MERESCHKOVSKY, CONST. **Contribution à la flore lichénologique des environs de Kazan. [The lichen flora of Kazan.]** Hedwigia **61:** 183–224. *Pl. 2, 1 fig.* 1919.—A provisional list in which certain genera, e. g., *Cladonia,* have not received full attention. The flora of Kazan is either terrestrial or forest. Species of *Physcia* abound. Notes on occurrence, distribution, exsiccati, etc. Practically all species noted are described in some detail and there are critical notes on some species. There are proposed several new combinations, a number of new varieties and many new forms.—*D. Reddick.*

## BACTERIA

1232. Bergstrand, Hilding. **On the nature of bacteria.** Jour. Infect. Diseases **27**: 1–22. *8 pl., 13 fig.* 1920.—The writer brings data and photographic evidence to prove that "bacteria may be regarded as Fungi imperfecti developed through reduction of higher forms and not as lowly primordial organisms to be placed at the very beginning of the organic world." He confirms the theory of Zopf that the fission fungi, probably with some exceptions. are able to pass through different developmental stages.—*Selman A. Waksman*

# PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

1233. Aruffo, Caterina Samsonoff. **Sopra due alghe calcaree di specie viventi, nel Post-pliocene inferiore di Livorno. [Two existing species of calcareous algae in the older Pleistocene of Leghorn.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) **28**$^1$: 359–362. 1919.—The two species of algae *Lithophyllum papillosum* (Zan.) Foslie *f. Cystosirae* (Hauck) Foslie and *Lithothamnium polymorphum* (L) Aresch. *f. tubercolata* (Foslie) are reported from the study of fossils in the collection of the R. Institute of Geology of Florence.—*F. M. Blodgett.*

1234. Bertrand, Paul. **Succession normale des flores houillères dans le bassin houiller du Gard. [Normal succession of the coal flora in the coal basin of Gard.]** Compt. Rend. Acad. Sci. Paris **170**: 331–333. 1920.—The flora of these beds is discussed in its bearing on the stratigraphy of the region.—*C. H. and W. K. Farr.*

1235. Braun-Blanquet, J. **Über die eiszeitliche Vegetation des südlichen Europa. [Upon the glacial vegetation of southern Europe.]** Viertelsjahrsschrift Naturf. Ges. Zurich. **64** Jg. 1919: xli–xliv. 1920.

1236. Braun-Blanquet, J. **Die Föhrenregion der Zentralpentäler, insbesondere Graubündens, in ihrer Bedeutung für die Florengeschichte. [The Fir region of the Central Alpine valleys, especially the Grisons, and its bearing on the floral history.]** Viertelsjahrsschrift Naturf. Ges. Zurich. **1918**: 59–86. 1920.

1237. Brochman-Jerosch, H. **Weitere Geschichtspunkte zur Beurteilung der Dryasflora [Additional viewpoints in the interpretation of the Dryas flora.]** Heim Festschrift Vierteljahrsscher Naturf. Ges. Zürich. **1919**: 35–49. 1920.

1238. Fleiszner, [—]. **Die Bildung fossiler Kohlen im Zusammenhange mit Verwitterungsvorgängen. [The formation of fossil coal in relation to processes of weathering.]** Berg. u. Hütten. Jahrb. **67**: 1–13. 1919.

1239. Florin, Rudolf. **Zur Kenntnis der Jungtertiären Pflanzenwelt Japans. [On knowledge of the later Tertiary plant world of Japan.]** Kgl. Svenska Vet.-Akad. Handl. **61**: 1–71. *6 pl.* 1920.—Fossil plants are described from Amakusa Island, Shimonoseki and Mogi and an unknown locality, all in southern Japan. The two principal localities are those of Amakusa and Mogi, the latter first made known by Nathorst some forty years ago, but the age of which had never been conclusively settled beyond the fact that it was post-Miocene. The Amakusa flora comprises representatives of the genera Taxodium, Juglans, Carpinus, Fagus, Celtis, Magnolia, Liquidambar, Sorbus, Prunus, Dictamnus, Rhus, Ilex, Acer, Aesculus, Elaeocarpus, Tilia, Stuartia, Cornus, Clethra, Diospyros, Apocynum, Viburnum, Symplocos?, Sophora?, Spiraea?. The Mogi flora contains the genera Taxodium, Salix, Fagus, Ulmus, Schizandra, Liquidambar, Phellodendron, Acer, Zizyphus, Elaeocarpus, Tilia, Stuartia?, Cornus and Viburnum. Both are contained in a tuff and have a majority of species in common. That from Amakusa has 35 per cent extinct forms and 48 per cent of its still existing species are represented in the present flora of southern Japan. That from Mogi has

39 per cent of extinct forms and of the remainder 45 per cent still exist in southern Japan. Three of the extra Japanese forms are confined to the existing flora of southeastern North America. There is an interesting discussion of the floral facies and its ecological indications as well as a review of the wide ranging Pliocene floras as shown by their presence throughout the Northern Hemipshere. The two floras described are considered to be of about the same age, that from Amakusa being, if anything, slightly younger than that from Mogi. Both are taken to indicate slightly cooler climatic conditions than prevail at the present time in southern Japan, and their age is considered to be late Pliocene.—*E. W. Berry.*

1240. FURRER, E. **Wandlungen in der Vegetationsdecke der Schweiz. [Changes in the vegetation of Switzerland.]** Viertelsjahrsschrift Naturf. Ges. Zurich. 64 Jg. 1919: iii–v. 1920.

1241. GROUT, F. F., AND BRODERICK, T. M. **Organic structures in the Biwabik iron-bearing formation of the Huronian in Minnesota.** Amer. Jour. Sci. 48: 199–205. 1919.—Describes organic remains from the pre-Cambrian rocks of Minnesota, including a new species of Alga, *Collenia biwabikensis.*—*E. W. Berry.*

1242. HESSELMAN, H. **Om pollenregn på hafvet och fjärrtransport af barrträdspollier. [The rain of pollen on the sea and the wide distribution of the pollen of trees.]** Geol. Fören. Förh. 41: 89–108. *4 fig.* 1919.

1243. IWASAKI, C. **A fundamental study of Japanese coal.** Tech. Repts. Tohoku Imp. Univ. Sendai 1: 1–35. *8 pl.* 1920.

1244. JONGMANS, W. J. **Stratigraphie van het Nederlandsch Productief Carboon. [Stratigraphy of the coal measures of Holland.]** *250 p. Charts 14–27.* Amsterdam, 1918.—This final report of the commission for the investigation of the coal measures of Holland is devoted to a detailed account of the stratigraphy as disclosed by underground exploration. There are some lists of fossil plants, but the work will be chiefly useful to botanists for the location of the numerous fossil plants described by the author in other publications. Its geological value is great.—*E. W. Berry.*

1245. KRÄUSEL, R. **Nachträge zur Tertiärflora Schlesiens. I. [Addendum to the Tertiary flora of Silesia.]** Jahrb. Preuss. Geol. Landes. für 1918, 39: 329–417. *Pl. 16–27.* 1920.—Records Macrosporium and Helicomia on Sequoia, a fern (Woodwardites), Torreya, Taxus, Pinus, Taxodium, Sequoia, Libocedrus, Salix, Myrica, Pterodarya, Juglans, Carya, Carpinus, Betula, Alnus, Castanopsis, Ulmus, Brasenia, Magnolia, Crataegus, Rubus, Potentilla, Acer, Vitis, Trapa, Cornus, Nyssa, Hypericum, Hippuris, Carpolithus, and Symplocos from the brown coal of Silesia.—*E. W. Berry.*

1246. KRÄUSEL, R. **Ein Beitrag zur Kenntnis der Diluvialflora von Ingramsdorf in Schlesien. [A contribution to the knowledge of the Pleistocene flora of Ingramsdorf in Silesia.]** Neues Jahrb. 1920, 1: 104–110. *Pl. 3.* 1920.—Figures a spot fungus with teleutospores on fragments of Phragmites, fern sporangia suggestive of *Polypodium vulgare,* and *Salvinia natans* from a peat and loam deposit at Ingramsdorf in Silesia.—*E. W. Berry.*

1247. KRÄUSEL, R., AND OTHERS. **Die Pflanzen des schlesischen Tertiärs. [The plants of the Tertiary of Silesia.]** Jahrb. Preuss. Geol. Landes. für 1917, $38^2$. *338 p., 26 pl.* 1919.—Silesia is a classic region for Tertiary plants, published work going back to the days of Volkmann's *Silesia subterranea* (1720) and several of GOEPPERT's early works, commencing in 1845, were devoted to their elucidation. The present work is a more or less critical revision of what is known of these floras. The leaves and fruits of the Betulaceae and Ulmaceae are discussed by REIMANN, a beginner in paleobotany, who was killed in the war; those of the conifers and Fagaceae are discussed by E. REICHENBACH; the Salicaceae, Aceraceae and remaining families by F. MEYER; and the woods of the browncoal by W. PRILL and R. KRÄUSEL. This last part is the most important for although the part dealing with the leaves and fruit is an exceed-

ingly useful summary to date, the authors bring no very critical experience to their task. They have proposed scarcely any new species, and have greatly reduced the number of recorded species from these Miocene deposits by combining a great many of Gœppert's ill-advised specific proposals. Thus the following which stood as species in the literature, mostly names of Gœppert disappear into the synonymy: 10 of Salix, 6 of Populus, 1 of Juglans, 1 of Myrica, 6 of Quercus, 1 of Castanea, 4 of Platanus, 4 of Acer, 1 of Rhus, 3 of Dombeyopsis, 1 of Trapa, 2 of Alnus, 7 of Betula, 3 of Carpinus and 7 of Ulmus. The woods described from the Silesia browncoal number 18 species and are referred to the following genera: Podocarpoxylon, Cedroxylon, Piceoxylon, Pinuxylon, Glyptodroloxylon, Taxodioxylon, Cupressinoxylon, and Juniperoxylon. A key to the wood structure of the recent and fossil Cupressinoxyla should prove useful to anatomists, especially those interested in fossil woods.—*E. W. Berry.*

1248. Kryshtofovich, A. **A new fossil palm and some other plants of the Tertiary flora of Japan.** Jour. Geol. Soc. Tokyo **27**: 1–20. *Pl. 13–15.* 1920.—Describes fossil plants from Shiogama and Tsukinoki in the province of Rikuzen and from Akihomura near Sendai. Species of Sabal, Juglans, Fagus, Castanea, Ficus, Liquidambar and Vitiphyllum are recorded from the former and Taxodium, Betula and Alnus from the latter.—There is a helpful discussion of the age of these and other Tertiary plant beds of Japan and the author concludes that the aforementioned florules along with those previously known from Azano, Kayakusa, Ogoya, Akiho, Shiogama, etc., are of Miocene age: those of Shiobara and Mogi are Pliocene: and those of Ishikari and Shitakara are Eocene.—*E. W. Berry.*

1249. Kubart, B. **Über den Verfall paläobotanischer Forschung in den Ländern deutscher Zunge. [Upon the decline of paleobotanical researches in German speaking countries.]** Österr. Bot. Zeitg. **1919**: 233–237.

1250. Neuweiler, E. **Die Pflanzenreste aus den Pfahlbauten am Alpenquai in Zurich und von Wollishofen sowie einer interglazialen Torfprobe von Niederweningen (Zürich). [The plant remains of the Lake dwellings at the Alpine quay in Zurich, from Wollishofen and from an interglacial peat boring at Niederweningen.]** Viertelsjahrsschrift. Naturf. Ges. Zurich. **64** Jg. **1919**: 617–648. 1920.

1251. Reid, Mrs. Eleanor M. **On two preglacial floras from Castle Eden (County Durham).** [Abstract.] Ann. and Mag. Nat. Hist. **6**: 247–248. 1920.—Fossil seeds were examined from clays found in fissures of the Magnesian Limestone at Castle Eden. The clays had been carried by the Scandinavian ice from the area now occupied by the North Sea. The study proved the presence of two seed-bearing clays of different ages. A comparison of the Cromerian, Teglian, Castle-Eden, Reuverian, and Pont-de-Gail floras on the bases of the percentages of all exotics, and of Chinese-North American exotics (i. e., plants now inhabiting the Far East of Asia or North America but not Western Europe), in each flora proved the Reuverian to be Lower Pliocene and the Castle-Eden flora to be Middle Pliocene. Therefore a study of fossil seeds made possible the discrimination of strata intimately mixed and the determination of their geological ages. The Castle-Eden Pliocene is characterized by the number of extinct and exotic forms and by the absence of aquatic species. Therefore the area now forming part of the North Sea probably was an upland valley four hundred feet above the Middle Pliocene sea-level. [From author's abstract of a paper read at a meeting of the Geological Society.] —*H. H. Clum.*

1252. Reid, Mrs. Eleanor M. **A comparative review of Pliocene floras based on the study of fossil seeds.** [Abstract.] Ann. and Mag. Nat. Hist. **6**: 248. 1920.—By plotting as a curve the percentages of the exotics and of the Chinese-North American exotics from the Cromerian, Teglian, Castle-Eden, Reuverian, and Pont-de-Gail floras, it was found that all lay along a smooth curve, indicating changes in the Pliocene and Miocene Ages. The position of the floras in time, as indicated by the curve, agrees with that determined by paleontology. The destruction and supplanting of the Chinese-North American exotic flora began about the Middle Miocene when the Europea and Asiatic Alpine ranges attained their maxi-

mum uplift. The curve indicates an incoming flora, the present flora of Western Europe which first appeared in the Miocene. Only part of it has survived, the destruction becoming greater after the Middle Pliocene. [From author's abstract of a paper read at a meeting of the Geological Society.]—*H. H. Clum.*

1253. Schlaffner, H. **Die geographischen Bedingungen der Moorbildung in Deutschland. [The geographical conditions of moor formation in Germany.]** Neue Münchener geogr. Studien. 1. *47 p.* 1920.

1254. Stutzer, O. **Über Methoden der mikroskopischer Kohlenuntersuchung. [Upon methods of microscopic coal investigation.]** Mikrokosmos. Zeits. angewandte Mikroskopie. 1919–1920. Hft. 6: 132–134.

1255. Werth, A. J. **Die wichtigsten Moor- und Torf-arten und ihre Entstehung in Vergangenheit und Gegenwart. [The important moor and peat species and their origin in the past and the present.]** Mitt. Ver. Förd. Moorkultur. 38: 46–51, 59–64. 1920.

## PATHOLOGY

G. H. Coons, *Editor*

C. W. Bennett, *Assistant Editor*

1256. Adams, J. F. **Rusts on conifers in Pennsylvania.** Pennsylvania Agric. Exp. Sta. Bull. 160. *30 p., 10 fig.* (1919) 1920.—See Bot. Absts. 6, Entry 1213.

1257. Anonymous. **Insects and diseases which injure trees.** Amer. Forestry 26: 308–309. 1920.—Contains formulae and general directions.—*Chas. H. Otis.*

1258. Anonymous. **The menace of silver leaf.** Jour. Bd. Agric. [London] 25: 870–871. 1918.—Silver leaf is reported as becoming increasingly serious to orchard trees. Valuable varieties of plum, like Victoria, are threatened with extinction. "By promptly cutting out silvered branches and by rigorously removing all dead tree, or trees which have begun to die back, it has been proved in practice that the spread of the disease is checked."—*D. Reddick.*

1259. Atwood, Alice C. **Errors in Lindau's "Thesaurus" and Saccardo's "Sylloge."** Mycologia 12: 169–171. 1920.

1260. Bailey, M. A. **Puccinia malvacearum and the mycoplasm theory.** Ann. Botany 34: 173–200. April, 1920.—See Bot. Absts. 6, Entry 774.

1261. Calvino, Mario. **El zacate prodigio. (Tripsacum latifolium, Hitchcock.) [A forage plant.]** Revist. Agric. Com. y Trab. 3: 62–67. *6 fig.* 1920.

1262. Campbell, C. **Su di un caso di invasione di ruggine nera dei cereali "Puccinia graminis Pers." in Terra di Lavoro. [An invasion of the black rust of cereals in Terra di Lavoro.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^1$: 142–145. 1919.—In 1913 in a restricted area in Atina, wheat was found so severely attacked by rust as to practically a total failure. A leaf rust classed as *Puccinia rubigovera* (*P. triticina*) is commonly present in this region but causes little damage and does not attack the barberries. The severe attack in question was found to have three centers lying about or on the windward side on barberry plantings. All the barberries were removed in 1913 except one plant; in 1914 the rust appeared only in the vicinity of this plant. With the destruction of the remaining barberry in 1914, the rust has not reappeared from 1915 to the present date. The introduction of *P. graminis* was attributed to experimental plantings of wheat in this neighborhood.—*F. M. Blodgett.*

1263. Carpenter, C. W. **Potato diseases in Hawaii and their control.** Hawaii Agric. Exp. Sta. Bull. 45. *48 p. 15 pl., 7 fig.* 1920.—A brief description of the more important potato diseases, including insect enemies, together with a discussion of the control measures

found to be most practicable. The following diseases are discussed: early blight, late blight, Fusarium wilt, Sclerotium wilt, late blight rot, storage rots, corky scab, black scurf or russet scab, tuber moth, borers, cut worms, and mites.—*J. M. Westgate.*

1264. Chaine, J. **L'attaque des vegetaux par les Termites. [Termite attacks on plants.]** Rev. Gén. Sci. Pures et Appliquées 31: 250–255, 281–285. 1920.—*Termes lucifugus*, a white ant of tropical origin, late in the eighteenth century invaded Rochelle, Rochefort and other places in western France, gradually spreading from there over a wide area and causing considerable damage, not only to buildings, furniture, and other structures of dead wood, but to living trees, shrubs and even herbaceous plants. A proposed method of control is outlined which consists in irrigation of the affected trees by one or another of three solutions, trenches holding 200 to 300 liters being used for this purpose. The essential ingredients of these solutions are mercuric bichloride, potassium ferrocyanide and potassium ferricyanide respectively, and these are used at approximately 3 per cent concentration. Irrigation with these solutions was repeated two or three times at intervals of two days, and then the trenches were refilled with soil. There were three such irrigations per annum, in the winter, spring and fall. Comparison at the end of the first year showed that the treated trees looked slightly better than the rest. At the end of the second year, however, the trees treated with the mercuric bichloride and the potassium ferrocyanide solutions no longer gave any external evidence of termites, while those treated with the ferricyanide merely showed great improvement. Extension of this method to the protection of potatoes, oats, cabbage, etc., seemed to be entirely successful up to 1914, and to have no ill effects upon the animals fed upon the materials thus protected.—*G. J. Peirce.*

1265 Conner, S. D., and E. N. Fergus. **Borax in fertilizers.** Purdue Univ. Agric. Exp. Sta. 239. *15 p., fig. 1–4.* 1920.—See Bot. Absts. 6, Entry 1381.

1266. Duddleston, B. H. **The modified rag doll and germinator box.** Purdue Univ. Agric. Exp. Sta. Bull. 236. *12 p., 7 fig.* 1920.—See Bot. Absts. 6, Entry 477.

1267. Groom, Percy. **Brown oak.** Quart. Jour. Forest. 14: 103–109. 1920.—When certain individual British oak trees, not differing in form in any recognizable way from the normal, are felled, it is discovered that their heart-wood is wholly or partially represented by a much more valuable type of wood known as "brown oak" or "red oak." This wood is firm in texture and deeper or richer in color than the normal wood. Sometimes uniformly colored, at other times it is traversed by bands or studded with patches of lighter and darker wood, which may in places be nearly black. This latter variegated type is the so-called "tortoiseshell" variety. The United Kingdom is the sole known geographical source of this product. In the trunk, the brown wood most frequently occurs at the base, extends upwards and downwards into the root for a variable distance, often tapering in such a manner that its ends apparently conicide with the inmost heart-wood. In the trunk, the brown wood, when traced upward, sometimes becomes confined to one side; and when the trunk divides into two or more leaders, the brown wood may ascend one but be lacking from the others. It may occur in upper parts of the tree but be partially or entirely lacking in any lower part of the trunk. In the trunk, the brown wood often stops at a large knot, and in such cases, the large limb connected with the knot is devoid of brown oak. Of two oak trees growing side by side, one may be normal and the other have the brown wood. The brown wood is often encountered in the form of burr-wood (burl). This brown wood is firm and hard.—Under the miscroscope, mature "brown oak" structurally agrees with ordinary oak hardwood. It differs from this only by the presence of considerable quantities of solid brown substance in the cavities (especially in the parenchyma) and the firmness with which it holds tannin. Careful microscopic investigations and cultural experiments lead to the conclusion that the coloring of the wood is due to a fungus whose identity is as yet unknown. The hyphae possess little power of attacking the walls, but feed nearly exclusively on substances in cells and especially of the parenchyma. At the expense of its food material, the fungus manufactures coloring materials that darken the wood.—*C. R. Tillotson.*

1268. Hamblin, C. O. **Collar rot of citrus trees.** Agric. Gaz. New South Wales 31: 439–441. *6 fig.* 1920.—Description and treatment given for this disease which is caused by *Fusarium limonis* Briosi.—*L. R. Waldron.*

1269. Hartley, Carl. **Stem lesions caused by excessive heat.** Jour. Agric. Res. 14: 595–604. 1918.—"Whitespot" occurs on very young seedlings of conifers and certain other plants and resembles closely typical "damping off." "The location of whitespot lesions on the stems, their observed relation to insolation and to dry surface soil, and the production of typical lesions by artificial heating, indicate excessive heat as the cause of most whitespot trouble." Records show that surface soils may reach a temperature well over 50°C.—Lesions on stems of similar plants ranging up to 4 years in age may be attributed to heat but further experimental evidence is needed.—*D. Reddick.*

1270. Harvey, R. B. **Relation of catalase, oxidase, and H-concentration to the formation of overgrowths.** Amer. Jour. Bot. 7: 211–221. *2 fig.* 1920.—See Bot. Absts. 6, Entry 1353.

1271. Hoffer, G. N. **Disease-free sweet corn seed.** Purdue Univ. Agric. Exp. Sta. Bull. 233. *12 p., 8 fig.* 1920.—This bulletin considers the experiments wherein sweet corn seed was tested for infection by root- and stalk-rot pathogenes and then planted. Other experiments dealt with ears selected by inspection as apparently sound. The symptoms of root and stalk rots are briefly described and the effects of the rots on production are noted. Experiments during 1919 at various places show a 10 to 30 per cent increase in yield from the apparently disease-free seed ears over those which germinate well but are infected. The methods of control recommended are (1) careful field selection and curing of the seed ears and (2) testing the ears for seed infections on germinators.—*G. N. Hoffer.*

1272. Hungerford, Charles W. **Rust in seed wheat and its relation to seedling infection.** Jour. Agric. Res. 19: 257–277. *Pl. 38–48, 1 fig.* 1920.—Uredinia and telia of *Puccinia graminis tritici* are found embedded in the pericarp on the hilar end of kernels of wheat (*Triticum*) and sometimes along the ventral groove as far up as the middle of the kernel. Infected kernels have black hilar ends and groups of telia appear as shining black specks under the lens. The percentage of seed infection in the rust years, 1915 and 1916, was very low. A little over 1 per cent was the largest quantity found in any sample. Durum wheats are most commonly affected.—The infection undoubtedly spreads to the kernel from original infection on rachis, rachilla or glumes.—Germinating power of seed is not impaired by rust infection. Rust infection in the field does not appear earlier on plants from infected seed than on plants from clean seed. 2,500 plants from infected seed grown under controlled conditions developed no rust. Mycelium was not found to spread from pericarp to young plants. Viable urediniospores sown with seed failed to produce infection.—Stem rust is not transmitted from one wheat crop to the next by means of infected seed. "In the writer's judgment, the occurrence of stem rust sori in the pericarp of the caryopses of grains and grasses has no especial significance; but the infection spreads to these tissues just as it does from an infection point in any of the vegetative parts of the plant."—*D. Reddick.*

1273. Hutchins, D. E. **Insignis-pine disease.** Jour. Agric. New Zealand 16: 37. 1918.—An attack at Khandallah on insignis pine began in early winter and increased through the wet season. It was worst in the warm wet spring. The leaves turned brown and dropped. When dry weather set in new leaves pushed forth. This disease is distinct from the South Australian disease caused by *Peridermium.* Climatic condititition are thought to be responsible.—*D. Reddick.*

1274. Jackson, A. B. **A possible cause of spike in sandal.** Indian Forester 45: 635. 1919.—A suggestion is made that spike might be caused by excessive parasitism of sandal on sandal.—*E. N. Munns.*

1275. Jackson, H. S. **New or noteworthy North American Ustilaginales.** Mycologia 12: 149–156. 1920.—See Bot. Absts. 6, Entry 775.

1276. Lingelsheim, A. **Über "steinreizker" in Schlesien. ["Steinreizker" in Silesia.]** Hedwigia 61: 380–382. 1920.—See Bot. Absts. 6, Entry 1220.

1277. Lopriore, G. **Recent biological researches on the rusts affecting cereals.** Internat. Rev. Sci. & Practice Agric. 10: 742–746. 1919.

1278. Magrou, J. **Immunité des plantes annuelles vis-à-vis des champignons symbiotiques. [Immunity of annual plants with respect to symbiotic fungi.]** Compt. Rend. Acad. Sci. Paris 170: 616–618. 1920.—Seeds of *Orobus coccineus* (*Lathyrus sphaericus*) were sown in soil infested with the mycorrhiza of *Orobus tuberosus*. The roots were invaded by the fungus, and after 40 days appeared the same in microscopic section as do the roots of *Orobus tuberosus*. After 70 days, however, the roots had completely destroyed the fungus by "phagocytosis." The immunity of *Orobus* resembles that of *Mercurialis* in that "phagocytosis" occurs some time after invasion by the fungus, rather than at the time of infection as is the case in *Solanum*.—*C. H. and W. K. Farr.*

1279. Murrill, W. A. **Oudemann's work on fungi.** Mycologia 12: 169. 1920.—See Bot. Absts. 6, Entry 169.

1280. Neger, F. W. **Die Krankheiten unserer Waldbäume und wichtigsten Gartengehölze. Kurzgefasstes Lehrbuch für Forstleute u. Studirende der Forstwissenschaft. [Diseases of forest trees and important orchard trees.]** *viii + 286 p., 234 fig.* Ferdinand Enke: Stuttgart, 1919.—"A compact text for foresters and students of forestry."

1281. [Pennell, Francis W.] **Index to American mycological literature.** Mycologia 12: 172–174. 1920.

1282. Quaintance, A. L., and E. H. Siegler. **Insecticides, spraying and fruit insect control.** Better Fruit 14[8]: 3–6, 40. Feb., 1920.—A popular summary of fruit-insect control methods. A spray-dilution table and a spray-combination diagram are given.—*A. E. Marneek.*

1283. Reinking, Otto A. **Diseases of economic plants in southern China.** Philippine Agric. 8: 109–134. *3 pl.* 1919.—This paper presents the results of a collecting trip made during May and June in the agricultural regions of southern China. Special attention was given to citrus diseases. The host plants are listed alphabetically according to the common names used in the Philippines; Latin names are also given, and in many cases the common Chinese names. Under each host is presented a list of the diseases which attack it, together with names of causal organisms, brief descriptions of symptoms, estimates of losses, and suggestions regarding control measures. Emphasis is placed upon the necessity of disease surveys in connection with plant quarantine.—*S. F. Trelease.*

1284. Rumbold, Caroline. **Giving medicine to trees.** Amer. Forestry 26: 359–362. *5 fig.* 1920.—An account of injection experiments, the purpose of which was to control or eliminate the fungus causing chestnut blight. The experiments were performed in Pennsylvania, the trees being for the most part Paragon scions grafted on native chestnut stock. Fifty-six organic and inorganic substances in solution were injected. Dilute solutions of lithium carbonate and lithium hydroxide injected in the spring and early summer months checked the progress of the fungus, but the results were not permanent. The work, which has been in progress several years, should be regarded as only preliminary.—*Chas. H. Otis.*

1285. Schaffnit, G. **Untersuchungen über die Brennfleckenkrankheit der Bohnen [Investigations concerning the anthracnose of beans.]** Mitteil. Deutsch. Landw. Ges. 25: 299. 1920.—The author discusses the work under way at the Bonn-Poppelsdorf Experiment Station. The perithecial form, *Glomerella lindemuthiana*, has not yet been found in Germany. Conidia from pods of the crop of 1919, which were preserved in a cold but sheltered place were still capable of germination on February 12, 1920. The author discusses the influence of air cur-

rents and plant foods on the disease. The question of susceptibility of varieties is treated at some length. Forty-five varieties of bush beans were tested. It was found that in one locality a variety might be relatively immune, while elsewhere it might be quite susceptible. —*A. J. Pieters.*

1286. Schultz, E. S., and Donald Folsom. **Transmission of the mosaic disease of Irish potatoes.** Jour. Agric. Res. 19: 315–337. *Pl. 49–56.* 1920.—Tubers from mosaic hills may be expected to transmit the disease. Tubers from apparently healthy plants growing near diseased plants also transmit the disease, at least in part. The tendency to do this is greater when there are only 2 or 3 tubers on the plant, when the relative size of the tuber in the parent hill is greater, and when the seed piece is near the "bud" end.—Transmission of the disease was effected by grafting, by transfer of juice, and by means of aphids, the experiments being carried out under various conditions, including field conditions, with test plants under screened cages. Intervarietal transfer of expressed juice from diseased plants to healthy gave infection. "Transmission was attempted, but without success so far as could be ascertained, in the same season, by means of flea beetles, Colorado potato beetle, the 'seed'-cutting knife, and contact of seed pieces, of roots, and of vine." Infection probably does not result from growing plants in soil on which diseased plants were produced the previous year. "It appears impossible either for affected plants to recover or, so long as diseased stock is not far off and insect carriers exist, to assure the maintenance of health of susceptible varieties by rogueing plots or by selecting hills, tubers or seed pieces." Control of insect carriers seems to be the important means of checking spread of potato mosaic.—*D. Reddick.*

1287. Subramaniam, L. S. **A Pythium disease of ginger, tobacco and papaya.** Mem. Dept. Agric. India (Bot. Ser.) 10: 181–194. *Pl. 1–6.* 1919.—See Bot. Absts. 6, Entry 784.

1288. Suematsu, N. **On the artificial culture of Helminthosporium Oryzae.** Bot. Mag. Tokyo 33: 291–297. *3 fig.* 1919.—See Bot. Absts. 6, Entry 785.

1289. Tubeuf, C. von. **Überblick über die Arten der Gattung Arceuthobium (Razoumowskia) mit besonderer Berücksichtigung ihrer Biologie und praktischen Bedeutung. [Review of the species of the genus Arceuthobium (Razoumowskia) with especial reference to their biology and practical importance.]** Naturw. Zeitschr. Forst- u. Landw. 17: 167–271. *Fig. 1–50.* 1919.—The author calls attention to the number and size of witches'-brooms caused by mistletoe occurring on most of North American species of conifers. It may be said that the formation of witches'-brooms is the most extensive and apparent manifestation of disease exhibited by North American Abieteae. Witches'-brooms on Cupresseae and Taxodium are not caused by Arceuthobium. Witches'-broom formations resulting from Arceuthobium may take place on all host plants. The root formation resembles that of *Viscum alba*, the European mistletoe, but that of Arceuthobium is more extensive than either *Loranthus europeous* or *Viscum alba*. The type of growth depends on the species of Arceuthobium and the host. The smaller species of Arceuthobium usually attack thin barked tree species; they develop in dense clusters and form thick brooms where young shoots and buds are present. The larger species occur chiefly on thick barked tree species; and although they do not exhibit the regular progress of the root system of the smaller varieties, they can develop a large system, and cause enormous thickening (hypertrophy) of infected branches. Infection by mistletoe most commonly takes place on 2–3 year old shoots; rarely on shoots older than 5 years. It may be supposed that the bark roots of Arceuthobium penetrate the first year growth the first fall. A more complete study of physiological characters and extent is desired of the American species. The various forms of Arceuthobium witches'-brooms are summarized.—The 13 well-known species in America and in the Old World, and the characters of the three less well known species in Mexico are tabulated, and each species is separately described with especial reference to host plants.—The biology of fruiting, seed distribution, germination, root and sucker formation, and of the sprout are discussed at length; reference being made to investigations of Heinricher, Peirce, MacDougal, and others. Pollination of European mistletoes is effected by flies and by wind, the pollen grains being caught in a drop of nectar or oil (Hein-

richer) exuded by the pistil of the female flower. One embryo is usually produced, but investigations have shown germination occasionally from two or more. The seed is "shot-out" of the ripe fruit; the propulsive force being obtained by tensions developed in the fruit membrane The seed is provided with mucilaginous threads, which balance the seed in flight, enable it to adhere to its host, and also act as moisture absorbents. Arceuthobium differs from other Loranthaceous parasites in its greater moisture requirement for germination. Although a point under dispute, the author contends that shedding of old sprouts is a regular process. The plant protects itself against excessive transpiration by the formation of an enduring row of epidermal cells, which may become several rows thick. The fibro-vascular bundles are either isolated or in groups separated by woody tissue. The irregularities in the anatomy of Arceuthobium sprouts are evidently occasioned by the large percentage of non-woody, divisible parenchyma, especially in the pith and medullary rays, and in the parenchyma between the bundles in the wood. This parenchyma increases in different degrees. The death of young shoots of infected trees is sometimes caused by this parasite; and whole trees may be killed. It causes injury not only by taking water and food from the plant, but by the chemical decomposition of cells, and by the mechanical rupturing of cell membranes.—*J. Roeser.*

1290. van Overeem, C. **Über zwei wenig bekannte Schmarotzer von Discomyceten. [Two little-known parasites of discomycetes.]** Hedwigia 61: 375–379. *1 fig.* 1920.

1291. Waldron, J. W., A. Gartley, C. R. Hemenway, J. N. S. Williams, G. P. Wilcox, T. H. Petrie, and H. P. Agee. **Report of the committee in charge of the Experiment Station.** Rept. Exp. Sta. Hawaiian Sugar Planters Assoc. 1919: 1–49. 1920.—See Bot. Absts. 6, Entry 901.

1292. Washburne, J. N. **White pine "flu."** Amer. Forestry 26: 343–345. *3 fig.* 1920. —Concerns the white pine blister rust and the pinon pine rust. Popular.—*Chas. H. Otis.*

1293. Wells, B. W. **Early stages in the development of certain Pachypsylla galls on Celtis.** Amer. Jour. Bot. 7: 275–285. *1 pl.* 1920.

1294. Wöber, A. **Versuche zur Bekämpfung des roten Brenners und des falschen Mehltaues der Reben im Jahre 1919. [Experiments in the control of red blight and downy mildew of the vine in the year 1919.]** Zeitschr. Landw. Versuchsw. Deutschösterreich 23: 1–6. 1920. —For the prevention of red blight (*Pseudopeziza tracheiphila*), painting the vines with 40 per cent iron sulphate solution during the winter followed by four applications of 1.5 per cent Bordeaux mixture during the growing season, gave the best results. Good results also were obtained by the use of commercial colloidal preparations of copper. Omission of the winter treatment lessened the control somewhat.—For the prevention of downy mildew (*Plasmopara viticola*), four spray applications were made, beginning just before the looming period. Good results were obtained by the use of Bordeaux mixture, various commercial colloidal preparations of copper, a mixture containing copper sulphate, zinc sulphate and lime, and a colloidal silver preparation.—*John W. Roberts.*

1295. Wormald, H. **The "brown rot" diseases of fruit trees, with special references to two biologic forms of Monilia cinerea Bon. II.** Ann. Botany 34: 143–172. April, 1920.—Continuing his work of comparing the organisms bringing about the different types of "Brown Rot" on fruits in England, the author in this contribution determined that the strain of *Monilia cinerea* infecting flowering shoots and cankers of apple trees (forma *mali*) differs from the organism isolated from plum (forma *pruni*) in its greater capacity to secrete an enzyme which oxidizes tannin. The oxidizing enzyme produced freely by *M. cinerea* forma *mali* was demonstrated by use of gum guaiac emulsion as well as by pyrogallic acid. The enzyme did not show any action upon tyrosin or hydroquinone but did produce a brownish-yellow color in solutions of tannic, gallic and pyrogallic acids. It was produced by "forma *mali*" in liquid culture media, infected fruits and spurs of apple and its presence is correlated by the writer with

the greater virulence toward apple shown by this form over that shown by the form isolated from Prunus.—On the basis of color, and size of pustules, dimensions of conidia, mode of conidial germination, viability of conidia (confirming EWERT's work) growth on culture media, and mode of parasitism the distinctions between *M. fructigena* and *M. cinerea* are summarized. Within the species *M. cinerea* at least two forms are recognizable culturally and parasitically distinct. "The American form of Monilia is more nearly related to *M. cinerea* than to *M. fructigena* but in cultures can be distinguished from the European form of *M. cinerea* by its mode of growth in cultures and by its numerous fructifications."—*G. H. Coons.*

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*
E. N. GATHERCOAL, *Assistant Editor*

1296. BALLARD, C. W. **Official standards for botanical drugs.** Jour. Amer. Pharm. Assoc. 9: 676–678. 1920.—In the revision of the U. S. P. IX, the author suggests some changes in the standards for botanical drugs, including definite botanical origins, with the elimination of such phrases as "and other species," etc. Suggestions are also offered regarding the phraseology for descriptions of plant tissues; descriptions of foreign materials; indication of diagnostical characters; indication of possible adulterants; standard fineness for powders used in descriptions; methods of technic used in mould examination. Author also urges the adoption of a standard for moisture in crude drugs.—*Anton Hogstad, Jr.*

1297. BERINGER, G. M. **A note on the examination of a commercial sample of oil of pennyroyal.** Amer. Jour. Pharm. 92: 460–462. 1920.—An examination of a commercial sample of oil of pennyroyal, showed it to contain 50 per cent of alcohol. Authors describe the various tests applied, which includes color, odor, S. G., B. P., iodoform test for pulegone and the reduction with nascent hydrogen to form menthol.—*Anton Hogstad, Jr.*

1298. CHECKLEY, GEORGE. **The formation of a student's botanical garden.** Pharm. Jour. 104: 44. 1920.—A botanical garden embracing all of the 46 drug plants listed in the Minor Syllabus (Pharmacy Examination) would require about 60 square yards of good loamy soil with plenty of sunshine. Preparation of the ground commences in the winter, the seed beds are prepared in the spring and plant specimens from the woods and meadows transplanted during the summer and fall. If desired, the plants may be arranged in the garden by the natural classification beginning with *Ranunculaceae*, or preferably, placed in those positions most suitable for their growth, each plant or plot being properly labeled. Plants best grown from seed (obtainable from a good seedsman) are *Avena sativa*, *Brassica alba*, *Brassica sinapoides*, *Conium maculatum*, *Cytisus scoparius*, *Datura stramonium*, *Digitalis purpurea*, *Foeniculum capillaceum*, *Hordeum distichon*, *Hyoscyamus niger*, *Matricaria chamomilla*, *Papaver rhoeas*, *Papaver somniferum*, *Ruta graveolens*. From the fields, woods and hedge rows may be collected *Althaea officinalis*, *Atropa belladonna*. *Bryonia dioica*, *Colchicum autumnale*, *Daphne laureola*, *Drypoteris filix-mas*, *Juniperus communis*, *Menyanthes trifoliata*, *Œnanthe crocata*, *Pinus sylvestris*, *Quercus robur*, *Rosa canina*, *Salix alba*, *Sambucus nigra*, *Solanum dulcamara*, *Taraxacum officinale*, *Triticum vulgare*, *Ulmus campestris*, *Valeriana officinalis*. Where trees are mentioned, one or two-year old specimens are understood. Specimens of the remaining plants will needs be obtained through a florist, herb nursery or an exchange bureau. These are *Aconitum napellus*, *Anthemis nobilis*, *Cochlearia armoracia*, *Colchicum autumnale*, *Daphne mezereum*, *Juniperus sabina*, *Lavendula vera*, *Mentha piperita*, *M. pulegium*, *M. viridis*, *Prunus laurocerasus*, *Rosmarinus officinalis* and *Taxus baccata*. Suggestions for establishing a drug plant exchange are offered.—*E. N. Gathercoal.*

1299. GRANT, E. H. **New tests for the identification of sparteine and guaiac.** Jour. Amer. Pharm. Assoc. 9: 704. 1920.—For sparteine: Extract alkaloid with chloroform from slightly ammoniacal solution. From chloroform solution extract with dilute sulphuric acid; solution

again made slightly alkaline and reextract with chloroform. Evaporate and add small amount of bromine water. A yellow precipitate, or, in the presence of large amounts of sparteine, an orange-colored oil forms, which dissolves on warming. Evaporate solution to dryness on water bath, and while still hot invert over concentrated ammonia water. Beautiful pink color develops if sparteine is present. Will detect 0.0005 gram of alkaloid, providing interfering substances are absent.—For guaiac: Extract with chloroform and separate into two portions. Evaporate one portion to dryness and treat residue with concentrated sulphuric acid. Intense red color indicates guaiac. Shake second portion with an equal volume of bromine water. Sometimes in the presence of guaiac, a sudden flash of purple or blue shoots through the chloroform just as the bromine dissolves in it. Separate chloroform layer and evaporate to dryness. Treat residue with concentrated sulphuric acid. Brilliant green indicates guaiac.—*Anton Hogstad, Jr.*

1300. Heyl, Frederick W., and Harris H. Hopkins. **The ragweed pollen proteins.** Jour. Amer. Chem. Soc. 42: 1738–1743. 1920.

1301. Heyl, Frederick W., and Charles Barkenbus. **Some constituents of Viburnum prunifolium.** Jour. Amer. Chem. Soc. 42: 1744–1755. 1920.

1302. Rhodes, Leland B. **Cockle-bur oil: a new seed oil.** Jour. Amer. Chem. Soc. 42: 1502–1507. 1920.

1303. Rusby, H. H. **Codes of botanical nomenclature in the United States Pharmacopoeia.** Jour. Amer. Pharm. Assoc. 9: 670–671. 1920.—A discussion of the so-called American and the so-called International Codes of botanical nomenclature, in which the author states that the latter one is misnamed, because it is not a code in the proper sense of the word, but that the former or the so-called American code is a code as it is based on a governing principle, namely, that priority of publication determines the name for a group or species. The name, however, is misleading as it emanated with a group of especially eminent botanists equally representative of Great Britain, Germany and France. Author states that the U. S. P. should not depart from the so-called American code.—*Anton Hogstad, Jr.*

1304. Tsakalotos, A. E. **Sind die mydriatischen Alkaloide der Belladonnawurzel bei Gegenwart von Alkohol mit Wasserdämpfen flüchtig? [Are the mydriatic alkaloids of Belladonna root volatile by the addition of alcohol in the presence of steam?]** Schweiz. Apotheker-Zeit. 57: 291–292. 1919.—A series of experiments and investigations proving that the alkaloids of belladonna root are not volatile when distilled with steam in the presence of alcohol. —*B. H. Hoffstein.*

1305. Viehoever, Arno. **Popular names of crude drugs.** Jour. Amer. Pharm. Assoc. 9: 671–676. 1920.—Author advocates greater care in the use of common names for crude drugs, and in so doing has shown why greater care should be exercised. Paper includes a discussion of the derivation of a number of drug terms, namely those which are derived from the scientific name; those which represent marked changes of the scientific name; those which have no connection with the scientific name but which may be identical with the native name; those which have been derived from physical characters, either of the drug itself or of conspicuous parts of the drug plant and those which have no definite meaning to the general trade.—A series of rules and a discussion of new terms follows. Author suggests that such plants as Spanish Digitalis (*Digitalis thapsi*) might well be called Digithapsis and that again such a plant as Mexican Scammony (*Ipomoea orizabensis*) might well be called Orizaba root or Orizap, to avoid confusion. He concludes by emphasizing the need of an agreement upon names which are not only simple and acceptable to the trade, but are more generally based upon scientific classification.—*Anton Hogstad, Jr.*

# PHYSIOLOGY

B. M. DUGGAR, *Editor*
CARROLL W. DODGE, *Assistant Editor*

## GENERAL

1306. BRIERLEY, W. B. **Some concepts in mycology—an attempt at synthesis.** Trans. British Mycolog. Soc. 6: 204-235. 1919.—The author advocates for fungi, both parasitic and saprophytic, the physiological species concept, rather than merely a morphological description—the latter assuming that form is primarily constant and hereditary. The author points out that organisms apparently similar morphologically may possess properties wholly distinct and individual when investigated quantitatively with respect to behavior and metabolic activity. He also deplores the idea so frequently advanced to the effect that physiological or biochemical attributes are inconstant. [See Bot. Absts. 4, Entry 1061; also anonymous abstract in Nature 104: 708. 1920.]—*B. M. Duggar.*

## PROTOPLASM, MOTILITY

1307. GALIPPE, V. **Recherches sur l'évolution du protoplasma de certaines cellules végétales par le procédé de la culture. [A study of the transformations of the protoplasm of certain plant cells by the culture method.]** Compt. Rend. Acad. Sci. Paris 170: 342-345. 1920.—Fragments of the epidermis of petals of various flowers were aseptically removed and placed from one to seventy-two hours in distilled sterile water saturated with ether or oxygenated. The tissue was then sectioned and stained. It was found that the protoplasm contracts and fragments. In these fragments are to be found small bodies, called "microzymas," which the author considers are the living parts of the protoplasm. These bodies give rise to ovoid and rod-shaped bacilli which persist in the cells for some time.—*C. H. and W. K. Farr.*

1308. LILLIE, RALPH S. **The nature of protoplasmic and nervous transmission.** Jour. Phys. Chem. 24: 165-191. 1920.—Nervous transmission is only a special case of protoplasmic transmission. The surface layer of protoplasm is exceedingly responsive to outer conditions and local stimulation evokes prompt response by the entire surface. This is particularly true in cited cases of blood corpuscles and fertilized eggs. These and many other, if not most other, reactions do not depend upon transfer of materials for the propagation of stimuli. It seems to the author unlikely that so general a phenomenon should be confined to living matter, which leads to the question of the general type of physico-chemical process to which protoplasmic transmission belongs. The essential generalizations established regarding nervous transmission are summarized as: (1) the excitation state may be initiated by a variety of means, (2) once aroused, the excitation state is transmitted continuously with no decrease in intensity from one region of tissue to an adjoining region, (3) local response ceases when stimulation ceases, (4) the rate of transmission is very different in different tissues and organisms, (5) velocity in any case is dependent on temperature (the 10° temperature coefficient being between 2 and 3), (6) transmission may be influenced reversibly by chemical substances, (7) transmission is not accompanied by change in form, by evident change in temperature, or by optical change, but is always accompanied by a change in electrical potential which travels (forming an action current) at the same rate as the activation wave. These generalizations, the general close correlation between local rate of development of action-currents in different tissues, and the rate of propagation of the excitation wave, the promptness with which rapidly conducting tissues respond and vice versa (indicating the adjustment of the tissue to electric currents having peculiarities of its own action-currents) and recent evidence pointing to the great influence exerted by the conductivity of the medium surrounding the nerve leads the author to conclude that "transmission is essentially a case of secondary electrical stimulation," stimulation "always being initiated at a certain linear distance in advance of the already stimulated active area." The next question of how electric currents stimulate protoplasm involves a consideration of the chemical changes at the surface. Any

injurious modification of the surface layer alters electrical potential. The author traces the similarity with the "local-action" theory of corrosion (the chemical effect being due to local electrical currents formed between adjoining areas of the metalic surface differing in composition or physical state) and considers in detail the characteristics of the propagation of such oxidation on wires and the resemblances between this and protoplasmic transmission. This similarity is not complete because of the structure of the protoplasm, the surface in living matter being the surface of the protoplasmic films and lamellae and not solely that of the cell.—*H. E. Pulling.*

## DIFFUSION, PERMEABILITY

1309. Collip, J. B. **Maintenance of osmotic pressure within the nucleus.** Jour. Biol. Chem. 42: 227–235. 1920.—It is suggested that the concentration of amino-àcid and other nitrogenous solutes of small molecular weight in the nucleus is sufficient to maintain its osmotic tension.—*G. B. Rigg.*

1310. Curtis, Otis F. **The upward translocation of food in woody plants. II. Is there normally an upward transfer of storage foods from the roots or trunk to the growing shoots?** Amer. Jour. Bot. 7: 286–295. 1920.—The common belief that food stored in the roots and lower trunks of trees is carried upward in the spring and used in shoot formation is shown to rest on evidence which is not conclusive. The author discusses and criticizes this evidence. In his own work with ringed branches, he finds that when a ring is made on that part of a stem which is from 5–15 or more years old or from 1–4 or more centimeters in diameter, the growth above the ring approximates that of a normal stem. Evidently upward movement of foods from points below the ring is not essential. In cases where growth has been somewhat lessened by ringing, this may be due to deficiency of water owing to the prevention of the formation of a new layer of xylem. When little stored food is available considerable shoot growth may still take place owing to the production of food by the leaves of the young shoot itself. Data are not sufficient to indicate how far back from the tip the food is withdrawn for use in shoot growth. The author believes that normally there is no upward movement of foods from the roots and perhaps little or none from the main trunk. He suggests that food stored in roots is used solely in root growth.—*E. W. Sinnott.*

1311. Loeb, Jacques. **On the cause of the influence of ions on the rate of diffusion of water through collodion membranes. I. and II.** Jour. Gen. Physiol. 2: 387–408, 563–576. 1920.—The similarity between the effects of electrolytes on free osmosis and electrical endosmose is demonstrated, and, since the effects of electrolytes on electrical endosmose seem best to be ascribed to their influence on the density of electrical charge on the membrane, it is concluded that the effect of electrolytes on free osmosis through a collodion membrane can be explained on the same basis. On the basis of the Helmholtz theory of electrical double layers, it seems that the ion having the same sign of charge as the membrane increases the diffusion of water towards the solution side of the membrane, while that ion having a charge opposite to that of the membrane decreases the charge on the latter and decreases the diffusion of water. The effects on the ions vary at different concentrations.—*O. F. Curtis.*

1312. Pantanelli, E. **Alterazioni del ricambio e della permeabilita cellulare a temperature prossime al congelamento. [Changes in cell permeability at temperatures very near freezing.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[1]: 205–209. 1919.—It was found that the cells of the endocarp of the mandarin orange (*Citrus nobilis*) when subjected to temperatures very near to freezing suffer a progressive increase in the cell permeability. This is made evident by a rapid emission of water from the tissue when it is kept dry, or by an exosmosis of substances from tissue immersed in water. This is favored by such substances as penetrate rapidly into the cells (glycerin, ethyl alcohol, citric acid, and free alkali); there is also a rapid destruction of sugar, limited by the supply of substances that may be absorbed and utilized for respiration (glycerin, ethyl alcohol, citric acid) or by such substances as curb the exosmosis of the sugars or by the intermediate products of respiration (sodium

chloride, potassium phosphate, citric acid). The sugars present in the exterior liquid (saccharose, glucose) did not act in this way because they were not absorbed. At such temperatures there is a lively autodigestion of protein, which is favored by the exosmosis of the soluble products of the digestion and by the more rapid destruction of the sugars.—*F. M. Blodgett.*

## MINERAL NUTRIENTS

1313. ANONYMOUS. [Rev. of: (1) BURD, J. S. **Rate of absorption of soil constituents at successive stages of plant growth.** Jour. Agric. Res. 18: 51–72. 1919. (2) HOAGLAND, D. R. **Relation of the concentration and reaction of the nutrient medium to the growth and absorption of the plant.** *Ibid.* 73–117. 1919.] Nature 104: 446. 1920.

1314. MAQUENNE, L., AND E. DEMOUSSY. **Sur l'absorption du calcium par les racines des plantes et ses propriétés antitoxiques vis-à-vis du cuivre. [The absorption of calcium by plant roots and its antitoxic properties with respect to copper.]** Compt. Rend. Acad. Sci. Paris 170: 420–425. 1920.—The antagonism of calcium and copper is studied with a view to determining whether the former interferes with the penetration of the latter or if it aids the plant in resisting the poison. Experiments were performed with pea seedlings in nutrient solutions containing either calcium sulphate, copper sulphate or a mixture of the two in certain proportions. In some cases sand cultures were used and in others quartz tubes. With the latter the solutions might be periodically renewed.—It was found that calcium does not reduce the permeability of the roots to copper, nor does copper affect the absorption of calcium. Hence it is not because of a modification in permeability that calcium is protective, nor does copper seem to be injurious because of its shutting out nutritive materials. The antitoxic action of calcium appears to be rather an internal effect, giving the plant an increased vigor to withstand toxic substances and increasing the volume of the plant through which copper may diffuse and interfering with its accumulation locally in the plant in sufficient quantity to become injurious.—*C. H. and W. K. Farr.*

## PHOTOSYNTHESIS

1315. ANONYMOUS. [Rev. of: RIEDEL, F. **Die Ausnützung der Hochofénabgase zur Kohlensäuredüngung. (The utilization of blast-furnace waste gases as carbon-dioxide fertilizer.)** Stahl u. Eisen, 39 Jahrg.: 1497–1506. 1919.] Rév. Gen. Sci. Pures et Appliquées 31: 132. 1920.—This paper, rather surprisingly widely noticed, reports the experiments of an engineer familiar with the problems besetting the operators of manufacturing plants discharging deleterious fumes into the air under the methods in common use. Without any indication of the means employed to separate the carbon-dioxide from the other gases accompanying it in the stack, greenhouse and open plot experiments and controls are described, details seeming desirable and usual to horticulturists and plant physiologists are omitted, and the results are given both in graphs and words. Thus the yield from tomato plants in a greenhouse into which $CO_2$ was introduced through perforated pipes was 2¾ times the weight of tomatoes from an equal number of plants in a similar greenhouse with ordinary air. Similarly cucumbers weighing a total of 138 kilos were produced in an ungassed greenhouse while the yield in a gassed house was 235 kilos, 1.7 times greater. Field experiments gave results showing a gain varying from 1½ to nearly 3 times the yield in gassed plots over those bathed in ordinary air. It may be pointed out that two photographs designed to show the advantage of adding $CO_2$ to ordinary air, and very striking in appearance, do not seem to be taken on the same scale. There is no evidence that botanical literature on the subject has been consulted. —*G. J. Peirce.*

1316. SPOEHR, H. A. **The development of conceptions of photosynthesis since Ingen-Housz.** Sci. Monthly 9: 32–46. 1919.—The author presents in this paper a comprehensive historical digest of the subject, emphasizing, in the earlier work, that of INGEN-HOUSZ. It is shown that step by step INGEN-HOUSZ approached the correct interpretation in his experi-

ments which are a masterpiece in manipulation and self-criticism. A few years later, De Saussure attacked the problem. The chemistry of Lavoisier had wrought a tremendous change. De Saussure asked a definite question and got a definite answer and established quantitative relations which others had described. Aside from the discovery of certain details of the process of photosynthesis, our knowledge of it is practically as De Saussure left it over 100 years ago. During this time something has been done by Dutrochet, Sachs, Pfeffer, Boehm, and Draper. Most of the work of the last 30 years has been along lines outlined by these workers but no new vistas have been opened nor original hypotheses formulated.—The most important problem of photosynthesis is probably the energy relation, and the old question of the action of the light in the reduction of carbon dioxid and water. Recent conceptions of the nature of light and of chemical processes ought to find application to the processes involved in photosynthesis, as should physical conceptions and methods of experimentation which as yet have not been applied to the study of photosynthesis with any degree of success.—For fifty years the formaldehyde theory of the development of sugars, formulated by Baeyer as a mere suggestion, has received greatest recognition. The experiments have followed three different lines of argument. (1) The reduction of carbon dioxid to formaldehyde by various chemical and photochemical means. (2) The detection of formaldehyde in illuminated green leaves. (3) The feeding of plants with formaldehyde as the only source of carbon. All these have yielded positive results. But a critical study of all the facts leads to the conclusion that more experimentation is needed.—The determination of the first sugar formed requires experimental proof. The fleshy joints of some cacti offer good material for this type of study. Tables of certain experiments with such material, including also the results of Brown and Morris with the garden nasturtium (*Tropaeolum majus*) are given.—*L. Pace.*

## METABOLISM (GENERAL)

1317. Ciamician, G., and C. Ravenna. **Sulla influenza di alcune sostanze organiche sullo sviluppo della piante. Nota III. [The influence of some organic substances on the development of plants.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) 28[1]: 13–20. 1919.—Having shown in a previous article that some of the fundamental compounds for the vegetable alkaloids do not injure bean plants, while almost all the natural alkaloids (and particularly caffein) are poisonous, he takes up the study of some derivatives of these fundamental compounds. The bases were used as phosphates or tartrates in solution (1 to 1000) and bean plants were sprinkled with these. He affirms that methyl groups, far from having a protective influence on the reactive groups such as the oxyhydrate and the amino and imino groups, increases the action of the fundamental substance that contains it. Other radicals also modify the action of organic compounds on plants as the propyl group in conine, the acetyl group in acetyl piperidine, diacetyl morphine, and acetanilide, and the radical of piperic acid in piperine. He also found that some of the poisonous substances used on bean plants have considerable influence on the formation of starch and on its hydrolysis so that with the different reagents he obtained different results when treating the leaves with iodine, depending on whether one or the other of these effects was produced.—*F. M. Blodgett.*

1318. Doff, A. W., and G. W. Roark, Jr. **The utilization of a-methylglucoside by Aspergillus niger.** Jour. Biol. Chem. 41: 475–481. 1920.—This fungus grows very poorly on media containing the glucoside as the only source of carbon, but readily on sucrose media in the presence of the glucoside. There was a slight difference between the activity of cultures before and after spore formation. Gradual cumulative adaptation to a substitute through several generations could not be demonstrated with any degree of certainty.—*G. B. Rigg.*

1319. Gruzewska, (Mrs.) Z. **Contribution a l'étude de la laminarine du Laminaria flexicaulis. [A contribution to the study of the laminarine of Laminaria flexicaulis.]** Compt. Rend. Acad. Sci. Paris 170: 521–523. 1920.—A study of the properties of this polysaccharid reveals that it is very much like dextrine except that it is laevo-rotary. The author confirms

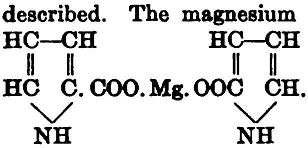
the reactions secured by Schmiedeberg. The fact that it precipitates spontaneously in water after standing a long time indicates its close relationship to the krepsine of Krefting which differs only in that it is insoluble in cool water. Laminarine is found to differ from algine in that it produces a red precipitate with alcoholic fuchsin. It is fermented by yeast and hydrolysed by many plant enzymes indicating that it is probably a reserve food of marine algae. —*C. H. and W. K. Farr.*

1320. Haas, A. R. C. **Studies on the reaction of plant juices.** Soil Sci. 9: 341–369. *1 pl., 11 fig.* 1920.—The actual and total acidities and alkali reserve of a number of agricultural plants were determined. The reaction of the juice of a plant is affected by changes in illumination, soil solution, and age. Determination of the actual acidity of alfalfa, alsike clover, barley, buckwheat, corn, peas, beans, lupines, red clover, mustard, oats, serradella, wheat, and timothy varied from $P_H$ 5.19 to $P_H$ 6.80. Determinations on sweet clover showed variations in acidity of 5.82 in the root to 8.00 in the upper part of the top. Young buckwheat seedlings showed less acidity than mature plants. A hydrogen-electrode vessel is described, requiring but 3–4 drops of juice.—*W. J. Robbins.*

1321. Jones, H. M. **Effect of carbohydrates on amino acid utilization of certain bacteria.** Jour. Infect. Diseases 27: 169–172. 1920.—In reply to a paper by Berman and Rettger on the effect of sugar upon protein metabolism, the author points out that, in the presence of sufficient carbohydrate, *B. proteus* shows no evidence of amino acid utilization, even though the reaction of the culture is maintained at neutrality. The softening of gelatin occurring in sugar-gelatin medium, due to the action of bacteria, is an acid rather than an enzymic-hydrolysis, and not a part of protein metabolism.—*Selman A. Waksman.*

1322. Myers, C. N., and C. Voegtlin. **The chemical isolation of vitamines.** Jour. Biol. Chem. 42: 199–205. 1920.

1323. Oddo, B., and G. Polacci. **Influenza del nucleo pirrolico nella formazione della clorofilla. [The influence of the pyrrole nucleus in the formation of chlorophyll.]** Gaz. Chim. Italiana 50: 54–70. *Fig. 1–4.* 1920.—This is in continuation of a note which appeared in 1915 (Gaz. Chim. Ital. 45: 197), and it is an extended discussion of the chemical phase of the question. After a study of the literature on the question of the importance and function of the pyrrole group in plant and animal (blood) pigments the preparation of a new compound is described. The magnesium salt of pyrrole-carbonic acid is found to have the formula



This compound was used in the preparation of nutritive solutions and plants were grown therein. The standard control solution contained the following salts: $Ca(NO_3)_2$, $(NH_4)_2SO_4$, $KNO_3$, $KH_2PO_4$. When the newly prepared magnesium pyrrole-carbonate was used, the phosphate was omitted and the organic compound used in a concentration equivalent to 0.0232 gm. of Mg. in 1000 cc. of water. *Zea mays, Solanum nigrum, Datura stramonium, Euphorbia sp.* and *Aster sinensis* were grown in solutions that were *very often* renewed. The following conclusions are appended. Plants grown in a nutrient medium free of iron but containing an assimilable pyrrole product form chlorophyll. This is a new phenomenon. Since iron is indispensable to the *greening* of the plastids, it is here suggested that its relation to the process may be one of catalyzer to the formation of the pyrrole nucleus, which in itself is the center of the chlorophyll complex. On the contrary, if this nucleus is already formed, the presence of iron is not indispensable. These experiments confirm the recent work of Willstätter and that of Eva Mameli. The function of magnesium in the *greening* of protoplasts is directly proportional to the presence of pyrrole.—*A. Bonazzi.*

1324. Okey, Ruth, and Anna W. Williams. **On inulin in the globe artichoke.** Jour. Amer. Chem. Soc. 42: 1693–1696. 1920.

1325. POWER, FREDERICK B., AND VICTOR K. CHESNUT. **The odorous constituents of apples. Emanation of acetaldehyde from the ripe fruit.** Jour. Amer. Chem. Soc. 42: 1509–1526. 1920.—The odorous constituents of apples were found to consist of amyl esters of formic, acetic, and caproic acids, with a small amount of caprylic ester. The authors found that acetaldehyde was exhaled. It is thought that "apple scald" may be due to this substance. Small amounts of methyl and ethyl alcohols were obtained also.—*J. M. Brannon.*

1326. TAYLOR, T. C., AND J. M. NELSON. **Fat associated with starch.** Jour. Amer. Chem. Soc. 42: 1726–1738. 1920.—The authors find that the major portion of the fatty material present in starch cannot be removed by solvents before hydrolysis. When corn starch freed of extraneous fat is hydrolyzed fatty acids are liberated. Palmitic acid is the principal one. The fat is liberated when hydrolysis has reached the erythrodextrin stage. The authors find that the palmitic acid is attached indirectly to the starch, directly to some unsaturated compound.—*J. M. Brannon.*

1327. VOSBURGH, WARREN C. **The specific rotation of fructose.** Jour. Amer. Chem. Soc. 42: 1696–1704. 1920.

## METABOLISM (NITROGEN RELATIONS)

1328. ALBRECHT, WILLIAM ALBERT. **Symbiotic nitrogen fixation as influenced by the nitrogen in the soil.** Soil Sci. 9: 275–327. *4 pl., 3 fig.* 1920.—See Bot. Absts. 6, Entry 1374.

1329. JOHNS, C. O., AND H. C. WATERMAN. **Some proteins from the Georgia velvet bean, Stizolobium deeringianum.** Jour. Biol. Chem. 42: 59–69. 1920.

1330. OSBORNE, T. B., AND A. J. WAKEMAN. **The proteins of green leaves.** Jour. Biol. Chem. 42: 1–26. 1920.—There is much less protein nitrogen than non-protein nitrogen in spinach leaves. Colloidal protein obtained from leaves is doubtless a mixture of several individuals, which are constituents of the cytoplasm and other portions of the cell. Apparently the colloidal protein occurs in the leaf in chemical combination with chlorophyll, phosphatides, and probably other substances.—*G. B. Rigg.*

1331. PEROTTI, R. **Su la presenza di una specie batterica nelle radici della Diplotaxis erucoides DC. [Bacteria in the roots of Diplotaxis erucoides DC.]** Atti R. Accad. Lincei Rend. (Cl. Sci. Fis. Mat. e Nat.) $28^1$: 331–335. 1919.—Bacteria were found constantly associated with rough gall-like swellings on the roots of *Diplotaxis erucoides* and were isolated therefrom. The organism proved to be a short motile rod and was easily grown on a variety of culture media. Under the cultural conditions used it proved neither to be ammonifying, nitrifying, denitrifying nor a fixer of nitrogen. The host is thought by agriculturists to have a fertilizing value and some explanation was sought. He affirms that the bacteria were certainly not harmful to the hosts as the latter were vigorous, but that they may have proteolytic properties which favor the movement of protein substances in the hosts and probably would be able to attack insoluble carbohydrates.—*F. M. Blodgett.*

## METABOLISM (ENZYMES, FERMENTATION)

1332. ANDRÉ, G. **Sur l'inversion du saccharose dans le suc d'orange. [The inversion of cane sugar in orange juice.]** Compt. Rend. Acad. Sci. Paris 170: 292–295. 1920.—Inversion of cane sugar in orange juice seems to be due primarily to the citric acid, although enzymes do play a minor part. There is less sugar inverted if the extract is boiled after neutralization than if it is not boiled. Inversion is accelerated by rise in temperature or by lengthening the boiling period of the unneutralized extract.—*C. H. and W. K. Farr.*

1333. ANONYMOUS. **Catalysis.** [Rev. of: RIDEAL, ERIC K., AND HUGH S. TAYLOR. **Catalysis in theory and practise.** Macmillan & Co.: London, 1919.] Nature 104: 463. 1920.

—The chapter on ferment and enzyme action is the part of this work which is distinctly physiological. "Ultimately the term catalysis will probably vanish from chemical literature . . . . though the term may remain for long as a convenient, though arbitrary, term of classification."—*O. A. Stevens.*

1334. Becking, L. G., M. Baas, and H. C. Hampton. **Measurement of the catalytic power of catalase.** Amer. Jour. Bot. 7: 261–274. *6 fig.* 1920.—The authors discuss and criticize the three common methods of measuring the strength of catalase action. They point out that the time in which a reaction is completed under the influence of an enzyme is the true measure of the strength of the enzyme, and describe an autographic method of measuring the reaction time of catalase. By the use of this method it was found that the reaction time is inversely proportional to the amount of enzyme present. There is a distinct latent period at the commencement of the reaction, before oxygen begins to be discharged. The enzyme is more or less injured during the reaction. The enzyme is injured by acids, but in neutral solutions retains its power for a long period. Alkali has an important effect on catalase and may act as a "peptisator." The method described may be used to determine the strength of a peroxide solution.—*E. W. Sinnott.*

1335. Burge, W. E., and E. L. Burge. **The effects of the chlorine substitution products of methane, acetaldehyde, and of sodium acetate on catalase production.** Jour. Biol. Chem. 41: 307–314. 1920.—The more chlorine that is introduced in the methane molecules, the more effective it becomes in decreasing catalase production in the liver. The ingestion of sodium acetate produces an increase in catalase. The first acts by destroying the enzyme and by decreasing the output from the liver. The second acts by stimulating the liver to increased output.—*G. B. Rigg.*

1336. Fred, E. B., W. H. Peterson, and A. Davenport. **Fermentation characteristics of certain pentose-destroying bacteria.** Jour. Biol. Chem. 42: 175–189. 1920.—Although the majority of microorganisms cannot utilize pentoses certain pentose-fermenting bacteria are widely distributed and no doubt play an important rôle in the economy of nature. Arabinose and xylose are rapidly decomposed, yielding acetic and lactic acids. Rhamnose was not attacked by pentose-fermenters.—*G. B. Rigg.*

1337. Peterson, W. H., and E. B. Fred. **The rôle of pentose-fermenting bacteria in the production of corn silage.** Jour. Biol. Chem. 41: 181–186. 1920.—Pentose-fermenting bacteria develop rapidly in raw or sterilized corn tissue. In sterilized silage they produce acetic acid, lactic acid, ethyl alcohol, and carbon dioxide.—*G. B. Rigg.*

1338. Peterson, W. H., and E. B. Fred. **The fermentation of glucose, galactose and mannose by Lactobacillus pentoaceticus. n. sp.** Jour. Biol. Chem. 42: 273–287. 1920.—The above name has been given to a pentose-fermenting bacterium exhibiting a wide range of activity both with respect to carbohydrates fermented and products formed. The aldo-hexoses, glucose, galactose, and mannose are fermented by this organism with the production of lactic acid, ethyl alcohol, carbon dioxide, and small quantities of acetic acid.—*G. B. Rigg.*

1339. Pickler, William Eugene. **Water content and temperature as factors influencing diastase formation in the barley grain.** Plant World 22: 221–238. 1919.—Some general relations of temperature to water absorption in barley seeds is discussed. Barley is semipermeable to LiCl solutions, and will absorb water even from the saturated solution. It is believed therefore that barley possesses a much higher osmotic pressure than *Xanthium* seeds. Diastase formation increases with water content of the grains at constant temperatures. Temperature was found to affect diastase formation to a much less degree than water content.—*Charles A. Shull.*

1340. Speakman, H. B. **Biochemistry of the acetone and butyl alcohol fermentation of starch by Bacillus granulobacter pectinovorum.** Jour. Biol. Chem. 41: 319–343. 1920.—This

organism, growing in a medium rich in starch changes the latter into glucose by exoenzyme activity. Glucose passes into the cell and is oxidized into acetic and butyric acids, and these are in part reduced to the corresponding alcohols.—*G. B. Rigg.*

1341. Steele, R. L., and A. C. McCarty. **Further data concerning the alleged relation of catalase to animal oxidations.** Jour. Biol. Chem. 42: 269–272. 1920.—Variations in catalase content and carbon dioxide production were not parallel in the rabbits and cats studied. —*G. B. Rigg.*

1342. Takamine, Jokichi, Jr., and Kokichi Oshima. **The properties of a specially prepared enzymic extract, Polyzime, comparing its starch liquefying power with malt diastase.** Jour. Amer. Chem. Soc. 42: 1261–1265. 1920.—"Polyzime is an aqueous extract of diastatic enzymes, made by a specially prepared culture of the fungus *Aspergillus Oryzea* on media consisting mainly of wheat bran." The diastatic power of Polyzime is preserved provided the preparation is kept at a temperature below 40°. It acts best in a neutral or slightly acid reaction. The optimum temperature for starch liquefaction by Polyzime is 50° for a digestion interval of 30 minutes to 2 hours, and 40° for a digestion interval of 24 hours. It is 3 to 4 times stronger than ordinary malt extract, according to Wohlgemuth's method.—*J. M. Brannon.*

## METABOLISM (RESPIRATION)

1343. Brooks, M. M. **Comparative studies on respiration. X. Toxic and antagonistic effects of magnesium in relation to the respiration of Bacillus subtilis.** Jour. Gen. Physiol. 2: 331–336. 1920.—Concentrations of $MgCl_2$ up to 0.01 M have little effect upon the rate of respiration of *Bacillus subtilis* as measured by $CO_2$ production; at 0.03 M there is an increase in the rate, while in the higher concentrations (0.5 and 1.0 M) there is a gradual decrease. There is marked antagonism between $MgCl_2$ and NaCl, and a slight antagonism between $MgCl_2$ and $CaCl_2$ as measured by change in rate of respiration. Change in rate was not due to changes in alkalinity of the medium.—*H. E. Knowlton.*

## GROWTH, DEVELOPMENT, REPRODUCTION

1344. Bezssonoff. **Sur l'obtention expérimentale de la sexualité chez les champignons et orientée sur la structure typique du plasma sexuel. [On the initiation of sexual reproduction in fungi by experimental means, and the existence of a cytoplasmic structure peculiar to the sexual process.]** Compt. Rend. Acad. Sci. Paris 170: 288–290. 1920.—This is a study of the effect of high concentrations of sucrose and citric acid in the nutrient media upon the cytoplasmic structure and the stimulation of the fungus to produce sex organs. The author holds that the sexual development is initiated by a retardation in oxidation processes. This is brought about by a reduction in the available water due to the high concentration of the nutritive solution. This conclusion is substantiated by cytological evidence. Numerous mitochondrial granules are found in the hyphae of species of *Aspergillus* which are beginning to form sex organs. These granules also appear abundantly in hyphae of the cultures in highly concentrated media. Their presence seems to indicate a retardation of oxidation.—*C. H. and W. K. Farr.*

1345. MacDougal, D. T. **Hydration and growth.** Proc. Amer. Phil. Soc. 58: 346–372. *Fig. 1–3.* 1919.—This paper is a summary prepared by the author from a lengthy manuscript. Conclusions are drawn from three lines of evidence, (a) "Measurements of the variations in volume of stems, leaves and fruits," correlating the rate and course of growth with environmental factors; (b) study of the composition and the arrangements of the components of living matter including seasonal and developmental changes; and (c) "measurements of the hydration reactions of tracts of living cell-masses"—"compared with the reactions of sections of plates of colloids made up in simulation of the composition of plants." Living material of plants is described as a "colloidal mixture consisting predominantly of pentosans, of a lesser proportion of albumin, albumin derivatives and amino-compounds, and of a minor

proportion of lipins, with the inevitable small amount of salts." Growth is defined as "hydration of colloidal material in a living condition" usually accompanied by increase in the colloidal mixture. As organs mature, the relative dry weight often increases, but in succulent plants the reverse is true due to the conversion of hexoses into pentosans which have a higher water capacity. Protoplasm may be considered as composed of two elements, the pentosans and the albumins, the hydration of the albumins being increased by increase in the hydrogen ion concentration and the pentosan decreased. Amino compounds increase the hydration of the artificial colloidal mixtures as well as increase the growth of plants in cultures. The mechanism of the increase of cell size is related to the assumption that the more solid phase of the cell contents would take the position of the outer layer and tend to increase faster than the liquid phase. The inter-relationships of the constituents of the solid and liquid phases of the colloidal protoplasm might form a kind of mosaic membrane, but it would be a membrane resulting from the product of the surface energy of the protoplasmic mass and that of the medium and would have "no other permanent or morphological value."

In the study of the effects of organic acids and their amino-compounds on growth the following colloids—agar, gelatin, agar-gelatin (8:2), and agar-oat-protein (8:2)—were tested at 16–17°C., for the amount of expansion from a dried thickness to complete hydration. The gelatin-asparagin test and the agar-gelatin-asparagin test are inconclusive due to the dispersion of the gelatin.

The various colloid combinations swelled, in general, in solutions of glycocoll at rates equal to or greater than in water. When glycocoll was combined with acetic acid the rate was reduced, with one exception, somewhat below that in the acid alone. It is shown by experiment with plant tissues that because of their complex nature no prediction of the effect of temperature changes upon imbibition can be made. In general "the increase in swelling in distilled water is seen to be about twice that in the acid in the rise from 18°C. to 38°C. The walnut fruit, as a type of a tissue which shows an increasing dry weight with age, and the tomato, which shows an increasing relative moisture content as it matures, were studied. Auxograph records of the course of development of the walnut shows that the increase in size is irregular, being dependent upon the ratio between transpiration and absorption. Actual shrinkages appeared when transpiration exceeded absorption. Similar results were recorded in the growth of the tomato. In both, when the increased temperature caused increased transpiration which was not offset by other conditions, the rate of growth decreased or shrinkage occurred. The percentage of water in the nuts was usually higher than in the twigs and stems which bore them. In fleshy, flat joints of *Opuntia* decrease was demonstrated at night and increase in growth coincident with the rise of temperature during the day. Decreased acidity in cells showing high pentosan content during the light period is given as the reason for this condition.—*Ernest Shaw Reynolds.*

1346. MACDOUGAL, D. T. **The physical factors in the growth of the tomato.** Bull. Torrey Bot. Club. 47: 261–269. 1920.—Observations on growth in the fruits of the tomato showed that they could be used as an example of development and growth without increase of dry weight. The rate of increase in diameter is not a measure of the actual accretion of water and solid material; furthermore, its culmination may not be reached until the fruit approaches maturity. The conclusion is made that in young fruits, the low salt content and acidity give a set of conditions in which imbibition is the chief distentive force, and in older fruits the higher acidity and salt content make osmotic action more important.—*P. A. Munz.*

1347. REED, H. S., AND F. F. HALMA. **The evidence for a growth-inhibiting substance in the pear tree.** Plant World 22: 239–247. *3 fig.* 1929.—The authors discuss the growth habits of new pear shoots, and present evidence in favor of the hypothesis that growth-inhibiting substances are generated in the apical portion of the shoot, which travel toward the base of the shoot, and maintain dormancy of the lateral buds. Horizontal shoots show the inhibition chiefly along the ventral side, while dorsal buds show considerable growth. Buds between dorsal and ventral position show intermediate growth. They take this behavior to indicate that the growth-inhibitor accumulates along the ventral side of the shoot, and thus frees the dorsal buds from its influence.—*C. A. Shull.*

1348. Salter, Robert M., and T. C. McIlvaine. **Effect of reaction of solution on germination of seeds and on growth of seedlings.** Jour. Agric. Res. 19: 73–95. *Pl. 15.* 1920.—Using two modifications of Shive's best solutions, the author obtains data showing the importance of active acidity in the germination of seeds and in the growth of seedlings of wheat, soybeans, corn, alfalfa, and red clover. Germination of the seed of the five plants as compared with the growth of the respective seedlings is found to be less sensitive to an acid reaction. The optimum reaction for germination lies between $P_H$ 2.96 and $P_H$ 7.71, a slightly acid reaction proving most favorable in all cases. In general, maximum growth of the seedlings of all the plants occurs in the culture with an exponent of $P_H$ 5.94–5.16; death occurs at $P_H$ 2.16; and growth is conspicuously depressed at $P_H$ 7.71. During the growth of wheat seedlings, there is a general tendency for the reaction of the culture solutions to shift to a point slightly below neutrality, the value of change in reaction depending upon the stability of the solution employed.—*R. W. Webb.*

1349. Vogg, L. **Polygonum cuspidatum Siebold und Zucc. Ein Studienversuch zur Pflanzenbiologie. [An experimental study in plant biology.]** Ber. Naturw. Verein Schwaben u. Neuberg 42: 175–183. 1919.—The author tabulates the results obtained by his study of the growth of this Japanese *Polygonum.* For periods varying in successive years from about 4 weeks to 7 weeks he records the daily elongation of the stem, together with the temperature, the barometric pressure, the moisture of the air, and the prevailing weather conditions. In his last series of observations he records the growth of the branches, as well as that of the stem. According to his deductions moist and warm weather are essential for rapid growth. —*A. W. Evans.*

## MOVEMENTS OF GROWTH AND TURGOR CHANGES

1350. Jennings, O. E. **The paper mulberry an "artillery plant."** Torreya 20: 52–53. 1920.—At Philadelphia on May 21, 1919, *Broussonetia papyrifera* Vent. was observed to be throwing out pollen in a smoky cloud, the filament apparently straightening with sufficient force to eject the pollen. In this respect the plant resembles the related *Pilea serpyllifolia* Wedd.—*J. C. Nelson.*

1351. Lorch, W. **Die Torsionen der Laubmoosseata. [Torsions in the setae of mosses.]** Hedwigia 61: 40–91. 1919.—One hundred and four species of mosses were examined for torsions of the setae. The results obtained embody both anatomical investigations and physiological experiments. For the experimental part of the problem a specially designed apparatus was used which permitted a rapid and accurate determination of the angle of torsion. Water content, age, and length of seta influenced greatly the degree and rapidity of the torsion movement. The results obtained from 1153 experiments seem to show that the torsion of the seta is a good specific character and that it could be made use of in taxonomic studies. —*Ernst Artschwager.*

## GERMINATION, RENEWAL OF ACTIVITY

1352. Sifton, H. B. **Longevity of the seeds of cereals, clovers, and timothy.** Amer. Jour. Bot. 7: 243–251. *5 fig.* 1920.—See Bot. Absts. 6, Entry 896.

## REGENERATION

1353. Harvey, R. B. **Relation of catalase, oxidase, and H+ concentration to the formation of overgrowths.** Amer. Jour. Bot. 7: 211–221. *2 fig.* 1920.—The author has studied the osmotic concentration of normal tissues and tumor tissues (produced by *Bacterium tumefaciens*) in *Ricinus* and beet, by determining the freezing point depression through the use of a thermocouple. Little difference is noted between the two types of tissue, and the author believes that the difference in osmotic concentration between them is so slight as to be quite unrelated to tumor production. The determination of the freezing point of expressed juices as an indi-

cation of osmotic concentration in the tissues he regards as open to serious objection.—The hydrogen-ion concentration he finds to be consistently a little lower in tumorous tissue, whether produced by *B. tumefaciens* or (in *Bryophyllum* leaves) by freezing, than in adjacent healthy tissue. He suggests that in the frozen tissues this may be due to precipitation of proteins. The activity of catalase and of oxidase is found to be considerably greater in tumorous than in healthy tissue, due evidently to the decrease in hydrogen-ion concentration there. The growth of intumescences in frozen spots on *Bryophyllum* leaves is apparently due to the higher rate of metabolism at these points and the consequent accumulation there of substances from the surrounding normal tissue. The author suggests that the dominance of a growing apex may be due not to a production within it of inhibiting substances but to the attraction to, and accumulation therein, of growth stimulating substances from the surrounding area.—*E. W. Sinnott.*

1354. Loeb, J. **The nature of the directive influence of gravity on the arrangement of organs in regeneration.** Jour. Gen. Physiol. 2: 373–386. 1920.—Continuing work previously reported the author shows that there is a close correlation between the distribution of a red pigment in leaves of *Bryophyllum calycinum* and the development of shoots and roots in the notches of a leaf. In leaves suspended vertically and sidewise in a moist chamber, roots and shoots develop chiefly on the lower side. It is in this region also that the red pigment collects. The red pigment is merely an indicator, for, with excess of water or in the dark, it is not evident. When shoots or roots develop on the lower side of a leaf, this half has a greater dry weight, while, when they develop on both sides, there is no appreciable difference in dry weights of the halves. The explanations offered are that gravity affects the distribution of sap, tending to cause it to collect more on the lower side, and that the organs thus favored grow a little more quickly than the others and tend to inhibit growth of similar organs in other places. Immersion of leaves in water eliminates the influence of gravity.—*Otis F. Curtis.*

1355. Loeb, J. **Quantitative laws in regeneration. II.** Jour. Gen. Physiol. 2: 651–657. 1920.—Continuing work previously reported the author gives data to confirm a previous statement that a piece of stem inhibits the growth in notches of *Bryophyllum* because necessary materials move from the leaf to the attached piece of stem. Under the conditions of the experiment the gain in weight of the stem was about 14 per cent more than the weight of shoots and roots that would have been produced from the notches if the leaf had been isolated. The distribution of a red pigment served as an indicator of the distribution of necessary materials.—*Otis F. Curtis.*

## TEMPERATURE RELATIONS

1356. Northrup, John H. **Concerning the hereditary adaptation of organisms to higher temperature.** Jour. Gen. Physiol. 2: 313–318. 1920.—See Bot. Absts. 5, Entry 433.

1357. Northrup, John H. **A device for regulating the temperature of incubators either above or below room temperature.** Jour. Gen. Physiol. 2: 309–311. 1920.—The temperature is controlled by means of a relay which regulates the flow of water through the jacket of a double-walled incubator. The relay directs the stream of water either through the incubator or to the waste pipe as required by the temperature changes. Either hot or cold water may be used depending on the temperature desired.—*H. E. Knowlton.*

## RADIANT ENERGY RELATIONS

1358. de Besteiro, Dolores C., and Michel-Durand. **Influence de l'éclairement sur l'absorption du glucose par les racines des plantes supérieures. [Influence of light intensity on the absorption of glucose by the roots of higher plants.]** Rev. Gen. Bot. 31: 94–108. 1919.—The effects of four different light intensities, namely: $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, and full sunlight were determined, using *Pisum sativum*, grown singly in water cultures, with the roots growing under sterile conditions. The authors found that when the tops were grown in a limited supply of

air there was practically no difference in the dry weights of the plants produced or the amounts of glucose absorbed by the roots of the plants under the different light intensities. With the plants whose tops were allowed to develop in the normal atmosphere, however, the amounts of glucose absorbed per plant were in the proportions of 1-3-4-5 for the four light intensities. The strongest light also produced the most vigorous plants, the dry weights being in the ratio of 2-6-7-11. Although larger amounts of glucose were absorbed by the plants growing in the brighter light, the amount of glucose absorbed per unit dry weight of the entire plant was substantially the same in each case.—*R. S. Nanz.*

1359. Coupin, Henri. **Sur la production de la chlorophylle par les végétaux exposés à une lumière discontinue. [The formation of chlorophyll in plants exposed to a discontinuous light.]** Compt. Rend. Acad. Sci. Paris 170: 403–405. 1920.—Seedlings raised in darkness were exposed to diffuse light on successive days for a given period each day. The change in color of the leaves was noted. It is found that the time of exposure required to produce chlorophyll differs with the species and also with the part of the plant concerned. Regions which contain a large supply of reserve food, such as cotyledons, turn green with less exposure than those not used for storage of nutritive materials.—*C. H. and W. K. Farr.*

## TOXIC AGENTS

1360. Clowes, G. H. A., and L. G. Keith. **Correlation of certain physical and chemical factors with toxicity to marine organisms.** Jour. Biol. Chem. 41: xxxvii. 1920.—Symmetrical dichloracetones are more toxic to developing sea urchins and to mice than asymmetrical ones are. The indications are that the symmetrical compounds diffuse more rapidly from a non-aqueous phase to an aqueous phase and hydrolyze more rapidly in a freely alkaline aqueous solution. Death of the cells is probably caused by the products of hydrolysis.—*G. B. Rigg.*

1361. Diénert, F. **Retard de la floraison causé par un gaz toxique. [Delay in flowering due to gas-poisoning.]** Rev. Vitic. 51: 379. 1919. Reprinted in: Rev. Gén. Sci. Pures et Appliquées, 31: 131–132. 1920.—Under the heading "Chronique et Correspondence," is a note on the above, reporting the accidental observation that the growth of a cherry tree in the open was so delayed by chlorine fumes in April that the tree bloomed in September and October and bore ripe fruit late in October. The suggestion is made that the regulated use of poisonous gases might be employed to produce desirable fruits out of season, and at high market price, by delaying the normal course of bloom and fruiting.—*G. J. Peirce.*

1362. Guerin, P., and Ch. Lormand. **Action du chlore et de diverses vapeurs sur les végétaux. [The effect of chlorine and of other gases upon plants.]** Compt. Rend. Acad. Sci. Paris 170: 401–403. 1920.—Most plants are not killed by exposure for two hours to an atmosphere containing one part in 2000 by weight of chlorine, methyl monochlor chloroformiate, bromacetone, chloropicrine, or mustard gas. The leaves usually change color and drop, but new ones appear after a time and normal growth is resumed. Leaf-fall takes place sooner in treatment with chlorine than with chloropicrine or mustard gas. Microscopic examination showed plasmolysis very soon after exposure to chlorine but only after a considerable time in mustard gas. Potted plants and cuttings of many cultivated species were used.—*C. H. and W. K. Farr.*

## ELECTRICITY AND MECHANICAL AGENTS

1363. Darnell-Smith, G. P. **The electrolytic treatment of seeds (Wolfryn process) before sowing.** Agric. Gaz. New South Wales 31: 393–395. 1920.—The author reviews an article published in Jour. Ministry for Agric. $26^{10}$.—*L. R. Waldron.*

## MISCELLANEOUS

1364. Koehler, A. E. **A new 0.1 N calomel electrode design.** Jour. Biol. Chem. 41: 619–620. 1920.

# SOIL SCIENCE

J. J. SKINNER, *Editor*
F. M. SCHERTZ, *Assistant Editor*

## GENERAL

1365. ANONYMOUS. **Fertilizers for fruits.** Amer. Fertilizer 52[5]: 59–64. 1920.—A discussion of fertilizer experiments with fruits is given and definite fertilizer formulae for different soil conditions are recommended.—*J. J. Skinner.*

1366. ANONYMOUS. **Soil fertility experiment in the Middle West.** Amer. Fertilizer 52[6]: 101. 1920.—The number of plots and acres in soil fertility experiments in the Middle Western States are as follows: Ohio has 275 acres and 3,000 plots; Illinois, 1,115 acres; Indiana, 306 acres; Wisconsin, 103 acres; Iowa, 552 acres in 1,975 plots; and Kansas, 59 acres in 582 plots. —*J. J. Skinner.*

1367. FIPPIN, ELMER O. **The status of lime in soil improvement.** Amer. Fertilizer 52[5]: 118–124. 1920.—A discussion of the use of lime materials and the effect of lime on soils.—*J. J. Skinner.*

1368. JONES, OWEN. **Soil fertility: Can it be preserved in Australian forests?** Australian Forest. Jour. 3: 71–72. 1920.—See Bot. Absts. 6, Entry 1032.

1369. KELLEY, W. P. **The present status of alkali.** California Agric. Exp. Sta. Circ. 219. *10 p.* 1920.—The author discusses the methods of prevention and the treatment of alkali lands. Saline irrigation water is to be avoided and the water table should be kept below the capillary reach of the surface. The leaching of excess salts from the soil involves the matter of drainage. Drainage, accompanied by flooding, is used successfully to remove white alkali from soils. Black alkali requires neutralization before it can be leached from soils if present in large amounts. Gypsum or some other flocculating agent should be added before flooding soils containing small amounts of black alkali.—*A. R. C. Haas.*

1370. MAQUENNE, L., AND E. DEMOUSSY. **Sur l'absorption du calcium par les racines des plantes et ses propriétés antitoxique vis-à-vis du cuivre. [The absorption of calcium by plant roots and its antitoxic properties with respect to copper.]** Compt. Rend. Acad. Sci. Paris 170: 420–425. 1920.—See Bot. Absts. 6, Entry 1314.

1371. STOATE, P. N. **The Eucalypts in relation to soil fertility.** Australian Forest. Jour. 3: 112–113. 1920.—See Bot. Absts. 6, Entry 1044.

1372. WORTH, F. J., AND MAUNG PO SAW. **Absorption of lime by soils.** Memoirs Dept. Agric. India 5: 157–171. 1919.—The soils used in the test were Hlegu, Hmawbi, Mandalay, Pwinbyu, Hopin and Sahmaw. The work indicates a new method for estimating the lime requirements of soils. The method is based upon the absorption of calcium bicarbonate by a solution of the soil sample. Lime absorption curves are graphically represented for the above soils.—*F. M. Schertz.*

## ACIDITY AND LIMING

1373. LIPMAN, J. G., AND A. W. BLAIR. **Lime as a factor in maintaining soil fertility I. Rotation without legumes.** Proc. Soc. Promotion Agric. Sci. 39: 124–134. 1919.—A series of experiments covering a period of ten years and designed to show the effect of lime on the nitrogen content of the soil as well as the yields of non-leguminous crops, are described. The crop rotation was at first corn, oats two years, wheat, timothy, but this was later changed so that there was but one year of oats and two of timothy. The results indicated: 1. A greater loss of nitrogen in the limed than in the unlimed plats. 2. The yield of dry matter on the limed

and unlimed plats was practically equal. 3. The addition of 320 pounds of nitrate of soda per acre to the plats receiving 16 tons of manure per acre increased the crop yields indicating that nitrogen was a limiting factor. The authors conclude "The results of these experiments would seem to show beyond a doubt, that for the lighter coastal plain soils, lime has very little place in rotations which entirely omit legumes."—*H. N. Vinall.*

## INFLUENCE OF BIOLOGICAL AGENTS

1374. ALBRECHT, WILLIAM ALBERT. **Symbiotic nitrogen fixation as influenced by the nitrogen in the soil.** Soil Sci. 9: 275–327. *4 pl., 3 fig.* 1920.—Soybeans and cowpeas were grown in pots in a soil low in nitrogen and organic matter to which varying amounts of sodium nitrate or clover tops were added. Nitrogen fixation was determined by analyzing for the total nitrogen before and after growth. Nitrates up to 1500 pounds of sodium nitrate per acre did not prove injurious to nitrogen fixation and did not affect the nodule production appreciably. In some cases the decaying organic matter caused heavy losses in nitrogen but after the loss ceased, large nitrogen fixation occurred. The organic matter added increased the nitrogen fixed by cowpeas. The maximum average fixation for duplicate pots of 5 cowpea plants was 1295 mgm.—*W. J. Robbins.*

1375. HEADDEN, W. P. **Some soil studies.** Proc. Soc. Promotion Agric. Sci. 39: 22–38. 1919.—The accumulation of excess amounts of nitric nitrogen in the soil is given as the cause of low yields and poor quality in both the sugar beet and wheat crops of Colorado. An increase of 40 parts per million of nitric nitrogen in the surface foot of soil, depressed the sugar content of beets from 15.4 to 11.9 per cent and produced other unfavorable results. It was found that a certain soil which had a maximum of 20.5 parts per million on March 4 showed a steady increase of nitric nitrogen during the summer. On August 25 the minimum was 47 parts per million and the maximum 333 parts per million of nitric nitrogen. The author believes that certain Colorado soils have the power to fix atmospheric nitrogen converting it into protein nitrogen through the agency of their bacterial flora, the **Azotobacter.** In experiments with soil taken from the fields he found a maximum nitrogen fixation of 124 parts per million in 48 days. This rate of fixation would add 1.5 tons of protein matter to the acre foot of soil in 48 days.—*H. N. Vinall.*

1376. LIPMAN, J. G., AND A. W. BLAIR. **Field experiments on the availability of nitrogenous fertilizers, 1908–1917.** Soil Sci. 9: 371–392. 1920.—A report is made of the second 5 year period of a study of the availability and nitrogen losses of various nitrogenous materials under a rotation of corn, oats, wheat and two years timothy on forty 1/20 acre plots in limed and unlimed condition. The average yields of dry matter and the percentage of nitrogen recovered were greater with mineral than organic materials. From 1913–17, an average loss of 66 per cent of the applied nitrogen occurred. The limed plots during 10 years lost 250 pounds more nitrogen than the unlimed. The supply of nitrogen and carbon was best maintained on the plots receiving farm manure. The work emphasizes the difficulty of maintaining the nitrogen supply of the soil at a high level under continuous cropping to non-leguminous crops, even when commercial fertilizers are supplied.—*W. J. Robbins.*

1377. MCCALL, A. G., AND A. M. SMITH. **Effect of manure-sulphur composts upon the availability of the potassium of green sand.** Jour. Agric. Res. 19: 239–256. *1 fig.* 1920.—Two green sands, one containing 5.88 per cent of potassium, the other 1.42 per cent were used to study the effect of sulphofication upon the solubility of the potassium. In composts consisting of green sand, manure and soil in different proportions, an appreciable amount of the potassium was made water-soluble through sulphofication. The compost containing the largest proportion of manure developed the highest degree of acidity, oxidized the greatest amount of sulphur, and produced the largest quantity of water-soluble potassium, while the composts in which soil was substituted for a part of the manure developed less acidity, oxidized less sulphur and produced a smaller amount of soluble potassium. When all the manure was replaced by soil the rate of sulphofication was so slow that at the end of 23 weeks only a

very small amount of acidity had developed and very little potassium had been made soluble. When no organic matter was added the amount of acidity and soluble sulphates were no greater than might be accounted for by the natural oxidation of sulphur.—Addition of ferrous and aluminum sulphates in small amounts failed to stimulate sulphofication, while calcium carbonate added to the sulphur-manure-soil compost stimulated action in early stages but the end result was no greater than without it.—More water-soluble potassium was formed from the high-potassium green sand but a larger percentage of total potassium present was liberated in the composts containing the low-potassium green sand. The total amounts of potassium recovered in aqueous extracts from the composts containing manure varied from 9.1 to 41.3 per cent of the total initial amounts present.—Composting of green sand, or of soil rich in potassium, with sulphur and manure may prove a practicable method of obtaining available potassium from comparatively insoluble materials.—*D. Reddick.*

1378. Neller, J. R. **The potential biochemical activity of the spores of soil bacteria.** Soil Sci. 9: 329–340. *1 fig.* 1920.—Infusions from five successive layers of the upper 64 cm. of soil were heated to 85°C. for 10 minutes. This treatment destroyed 91.3–98.4 per cent of the organisms originally present. Inoculating with heated infusions produced 39–46.6 per cent as much ammonia in 7 days and about 77 per cent of the $CO_2$ produced by inoculating with unheated infusions. The bacterial spores of the soil are capable of energetic activity when supplied with sufficient food and moisture.—*W. J. Robbins.*

1379. Plymen, F. J., and Bal. **The biological aspects of wheat cultivation on embanked soils.** Agric. Jour. India 15: 289–300. 1920.—Cultivation and other means of increasing aeration of the black flood soils produce a condition favorable to crop production. The soils possess good power for ammonification and N fixation but are slow in nitrification. Nitrification increases when the rainy weather cultivation is performed. Lack of available nitrogen or the presence of some deleterious substance formed under anaerobic conditions is attributed to be the cause of crop failure.—*J. J. Skinner.*

## CROP FERTILIZATION

1380. Blair, A. W. **Utilizing soil potash by means of intermediary crops.** Proc. Soc. Promotion Agric. Sci. 39: 69–74. 1919.—New sources of potash discovered by chemists in the United States have made available "not over one-fourth of the pre-war consumption" of potash fertilizer. Most of the soils in the United States are well supplied with potash in the form of mineral materials but much of this potash is unavailable or only slowly available to the growing crop. In a study of the problem of making this supply of potash available it was found that the dry matter of rape and field peas contained an unusually large percentage of $K_2O$. The growing of such crops as a preparation for corn, alfalfa, or small grain is suggested as a means of supplying the desired potash in available form.—*H. N. Vinall.*

1381. Conner, S. D., and E. N. Fergus. **Borax in fertilizers.** Purdue Univ. Agric. Exp. Sta. Bull. 239. *15 p., 4 fig.* 1920.—Borax injury to corn resulting from the use of Searles Lake potash in Indiana during 1917–1919 is described. Field tests conducted at two points in 1919 showed that from 0.5 up to 4 pounds of borax per acre produced injury when drilled in the row with corn, that 16–18 pounds worked into the entire surface soil produced no injury, and that the damage was less in clay than in sand or muck, less in neutral than in acid soils, and less when rains accompanied the application. Borax causes injury by retarding or preventing chlorophyll formation. Bleaching, tip burn and wilting are the symptoms. Soybeans are more sensitive to borax than corn, while wheat, oats, rye and corn are equally susceptible. Only the Searles Lake potash contained enough borax to cause injury. Field tests showed that American potash fertilizer was equivalent to the German product in fertilizing values. A brief résumé of the literature is presented.—*Max W. Gardner.*

1382. Voelcker, J. Augustus. **The Woburn Experimental Station of the Royal Agricultural Society of England. Field experiments, 1919.** Jour. Royal Agric. Soc. England, 80:

418–430. 1919.—The 43rd report of the fertilizer experiments with the continuous growth of wheat and barley is made. The application of ammonium sulphate year after year has produced an acid condition which prevents a good growth. Largest yield was secured with stable manure. Manure from animals fed linseed and cotton cake was practically the same as that from corn fed animals. Leather as a source of nitrogen was ineffective. Ground limestone produced larger yields than did chalk.—*J. J. Skinner.*

1383. Voelcker, J. Augustus. **The Woburn Experimental Station of the Royal Agricultural Society of England. Pot-culture experiments, 1919.** Jour. Royal Agric. Soc. England, **80**: 430–438. *3 pl.* 1919.—It is shown that insoluble forms of arsenic, as arsenious acid, up to 0.1 per cent can be used without injury to wheat. The more soluble forms as arsenic acid or the soda salts of either arsenious or arsenic acid cause a decrease when used in amounts of 0.02 per cent and kill at 0.05 per cent. As a top dressing sodium nitrate proved more valuable than did ammonium sulphate, ammonium nitrate or calcium nitrate.—*J. J. Skinner.*

## FERTILIZER RESOURCES

1384. Anonymous. **Fertilizer work by the Government in 1919.** Amer. Fertilizer $52^2$: 61–63. 1920.—Details from reports of several Bureaus of the U. S. Department of Agriculture. —*J. J. Skinner.*

1385. Anonymous. **Potash and bromine in Texas lakes.** Amer. Fertilizer $52^6$: 72–73. 1920.—Brines that contain potash and bromine have been discovered in alkali lakes in Gaines, Lynn and Terry Counties, Texas, on the plain south of the Panhandle region. The lakes range in area from 35 to 7000 acres, lie in flat valleys and have no surface outlet. Analysis of brines from two of the lakes is given. The salts of these brines contain a smaller percentage of potash than that yielded by the potash material of Germany, Alsace, Nebraska, and Searles Lake, but they contain a relatively high percentage of bromine.—*J. J. Skinner.*

1386. Anonymous. **Note.** Nature **104**: 447. 1920.—Reference to results obtained by Garelli reported in La Nature for Nov. 29, 1919, on extracting nitrate of ammonia from surplus stock of explosives.—*O. A. Stevens.*

1387. Briggs, L. George, **A survey of the weighing and handling problem of the fertilizer industry.** Amer. Fertilizer $52^{12}$: 102c–103. 1920.—Equipment used in fertilizer manufacture is discussed.—*J. J. Skinner.*

1388. Calvino, Mario. **La fertilidad de le tierra y los abonos. V. Los abonos minerales. [Chemical fertilizers.]** Revist. Agric. Com. y Trab. **3**: 23–26. *2 fig.* 1920.

1389. Carter, Spencer L. **The manufacture and distribution of acid phosphate.** Amer. Fertilizer $52^4$: 61–66. 1920.—An address delivered during Farmers' Week at the Ohio State University, discussing the details of acid phosphate manufacture.—*J. J. Skinner.*

1390. Goldenweiser, E. A. **A survey of the fertilizer industry.** Amer. Fertilizer $52^1$: 53–68a. 1920.—A general survey of the fertilizer industry is given, together with tabular material and a discussion of the following subjects: Materials used in mixed fertilizers; materials used in the manufacture of sulphuric acid; sources of ammonia and amounts of each used in mixed fertilizers in 1918.—*J. J. Skinner.*

1391. Huntington, W. D. **The future of the fertilizer industry.** Amer. Fertilizer $52^7$: 61–63. 1920.

1392. Whittle, C. A. **Fertilizer formula finder for southern crops.** Amer. Fertilizer $52^6$: 58–59. 1920.—The description of a fertilizer formula finder issued by J. N. Harper. The instrument is a double disc made of card board and is unique in many particulars. With a given crop in mind the disc is turned, one upon the other, according to directions and a desirable fertilizer combination is given for any soil type.—*J. J. Skinner.*

# MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

1393. Lantes, Adelaide. **Una desecadora para ejemplares de herbario.** **[A desiccator for botanical specimens.]** Revist. Agric. Com. y Trab. **3**: 32. 1920.—Describes a box built to dry botanical specimens by the use of some hygroscopic material such as quicklime.—*F. M. Blodgett.*

1394. Lee, G. S. **Abaca (Manila hemp): the fiber monopoly of the Philippine Islands.** Sci. Monthly **11**: 159–170. 1920.—The natives of the Philippines use varieties of ferns, palms, battams, and vines for their fibers. But Abaco and Maguey are of notable commercial importance for rope and bag manufacture. Sissal, henequen, kapok and ramie have possibilities, but have not been fully developed.—The abaco plant is closely related to the banana and the plantain. The name Manila hemp is very misleading, suggesting as it does *Cannabis sativa*, while it really comes from *Musa textilis*. Abaco is the term applied to the plant as well as to the fiber. As many as fourteen varieties of this plant are cultivated. It is most successfully cultivated in the south two-thirds of the Philippines up to 300 feet above sea-level. —Methods of cultivation, kinds of soil, harvesting, etc., are briefly discussed.—The fiber is extracted from the overlapping leaf-bases. It is used for ropes, hats, matting, etc., and the waste is used in making Manila paper.—*L. Pace.*

1395. Smyth, E. Graywood. **Cotton insects in Porto Rico.** Entomol. News **31**: 121–125. 1920.—Pink boll worm not reported as yet. Cotton leaf caterpillar often locally serious; control by dusting method too expensive for average grower and destruction of wild food plants of the insect is advised. Chief of these are *Urena lobata* and *Malachra rotundifolia*, the former attracting the fire ant *Solenopsis geminata* by honey ducts on the underside of the leaf. This weed carries the insect across the gap between cotton crops. Thrips cause scars underneath the calyx and seem to be concerned with a disease which causes adherence of calxy to boll thus preventing proper bursting. Other insects mentioned, also a fungus *Agrostalagmus albus* as a natural enemy of the cotton aphis.—*O. A. Stevens.*

1396. Weiss, Harry B. **Notes on Thymalus fulgidus Er., and its fungus hosts in New Jersey.** Entomol. News **31**: 1–3. 1920.—Notes on life history of a beetle which breeds in *Polyporus betulinus* and *Daldalea confragosa*. Both larvae and adults feed on the fungus and when numerous completely riddle it.—*O. A. Stevens.*

1397. Wittrock, Veit Brecher. **Anteckningar om nordiska namn på Stellaria media (L.) Cyr.** **[Notes on Norse names of Stellaria media (L.) Cyr.]** [Swedish.] Acta Horti Bergiani (Stockholm) **6**²: 1–40. *Map.* Posthumous, edited by Rob. E. Fries. 1918.—The author gives an extensive list of names for *Stellaria media*, used in Sweden, Norway, Denmark, Faeroe Islands, Iceland, Finland and Lapland, also recording the provinces or districts where the different names are used.—*P. A. Rydberg.*

# BOTANICAL ABSTRACTS

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ENTRIES 1398–2032

## AGRONOMY

C. V. PIPER, *Editor*
MARY R. BURR, *Assistant Editor*

1398. ANONYMOUS. **United States grades for milled rice recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. 133. *16 p.* 1920.

1399. ANONYMOUS. **Spur feterita.** U. S. Dept. Agric. Dept. Circ. 124. *4 p.* 1920.—A member of the sorghum group. General notes on culture and feeding value.—*L. R. Hesler.*

1400. ANONYMOUS. **Grimm alfalfa.** U. S. Dept. Agric. Dept. Circ. 123. *4 p.* 1920.—Description, seeding, and inoculation.—*L. R. Hesler.*

1401. ANONYMOUS. **Dry-land alfalfa.** U. S. Dept. Agric. Dept. Circ. 122. *4 p.* 1920. Description and discussion of seeding.—*L. R. Hesler.*

1402. ANONYMOUS. **Velvet beans.** U. S. Dept. Agric. Dept. Circ. 121. *3 p.* 1920.—Description, planting, feeding value, and notes on varieties.—*L. R. Hesler.*

1403. ANONYMOUS. **Alfalfa.** U. S. Dept. Agric. Dept. Circ. 115. *6 p.* 1920.—A general discussion, including description, soil requirements, preparation of land, liming, fertilising, inoculation, seeding, and treatment of the stand.—*L. R. Hesler.*

1404. ANONYMOUS. **Effect of frost on cane.** [Rev. of: ANONYMOUS. **Letter to Nambour Chronicle.**] Australian Sugar Jour. 12: 291. 1920.—The writer notes the effect of frost on sugar cane during the past 18 years, and states that an early frost is most serious to cane to be cut during the oncoming crushing season. Cane that is intended to stand over is injured according to the forwardness of growth, for while the younger and later plants may be injured more severely, the tops fall over and form a protection for the new growth. In 1908 the writer had a crop, estimated to cut 18 tons per acre, injured by frost which he let stand over, with the result of a gain the next season of over 22 tons per acre in 1910 freezing increased the yield from a 50 ton estimate to 124 tons actually cut in 1911.—*E. Koch.*

1405. BARBER, C. A. **The growth of the sugar cane. No. VIII.** Internat. Sugar Jour. 22: 442–446. *3 pl., 5 fig.* 1920.—Thickness of cane within certain limits is fixed for each variety. Ordinary sugar cane in the field will have a thickness of from 1½ to 2 inches, but there are two classes in which these limits are overstepped. "Elephant" canes, 2 to 3 inches

in thickness, do not grow very tall, do not fall easily, and are resistant to commoner cane diseases. In contrast to these are the varieties indigenous in India, which are less than an inch in thickness and have a thick tough rind and much fiber. Canes are divided into three classes: Ukl, thin and fibrous, with sweet juice; Paunda, 1½ to 2 inches in diameter; Ganna, ½ to 1 inch in diameter, with less fiber and more juice than the Ukl canes, juice poor in quality, less hardy and more liable to disease. Author gives description of the habits of growth of the cane and points out that in some cases the shape of the joints has been useful in determining the male parentage of unbagged seedlings. Experiments have shown a well-defined tendency toward the more slender seedlings being slightly richer in juice than the thicker ones.—*E. Koch.*

1406. Blair, R. E. **The work of the Yuma reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 75. *77 p. Fig. 1–32.* 1920.—A discussion of crop conditions, cotton variety tests and ratooning, cotton thinning, time of planting, breeding; variety tests for alfalfa, grain sorghums, flax, velvet beans, horse beans, forage sorghums, giant Bermuda grass, deciduous and citrus fruits, vegetables, ornamental trees and shrubs.—*L. R. Hesler.*

1407. Blaringhem, L. **Production par traumatisme d'une forme nouvelle de maïs à caryposes multiples, Zea Mays var. polysperma. [The traumatic origin of a new form of maize with multiple fruits, Zea Mays var. polysperma.]** Compt. Rend. Acad. Sci. Paris 170: 677–679. 1920.

1408. Calvino, Mario. **"Jack bean" y "sword bean" o sean los frijoles "canavali." [Jack beans and sword beans are Canavali beans.]** Revist. Agric. Com. y Trab. 3: 57–61. *5 fig.* 1920.—Analyses of the "Jack bean," *Canavalia ensiformis*, and "sword bean," *Canavalia gladita*, are given, and they are recommended for trial in Cuba.—*F. M. Blodgett.*

1409. Calvino, Mario. **El zacate prodigio (Tripsacum latifolium Hitchcock). [The grass marvel, Tripsacum latifolium.]** Revist. Agric. Com. y Trab. 3: 62–67. *6 fig.* 1920.—This perennial grass had its origin in Mexico. A botanical description is given. It is propagated by cuttings and produces forage having a comparatively high protein content for a grass, according to the analysis given. It is attacked by the rust *Puccinia polysora*, which causes little damage when the crop is cut at six month intervals.—*F. M. Blodgett.*

1410. Espino, Rafael B. **A review of the coconut investigations at the College of Agriculture.** Philippine Agric. 8: 161–178. 1919.

1411. Garnier, M. **Plantes nouvelles pour 1920. [New plants for 1920.]** Rev. Hortic. [Paris] 92: 34–35. *Fig. 9–10.* 1920.—See Bot. Absts. 6, Entry 1849.

1412. Gautier, Armand and P. Clausmann. **Action des fluorures sur la végétation: B. Cultures en champ d'expériences. [Action of fluorides on vegetation; experimental field trials.]** Compt. Rend. Acad. Sci. Paris 169: 115–122. 1919.—See Bot. Absts. 6, Entry 1998.

1413. Hansen, Dan. **The work of the Huntley reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 86. *32 p., 5 fig.* 1920—Experiments on crop rotation are described. Results of variety tests for corn and barley given and notes on fruit trees recorded.—*L. R. Hesler.*

1414. Hansen, Albert A. **Cocklebur.** U. S. Dept. Agric. Dept. Circ. 109. *6 p., 1 fig.* 1920.—Distribution, description, and uses of cocklebur (*Xanthium* spp.) are given. Notes on damage and eradication measures are also presented.—*L. R. Hesler.*

1415. Harlan, Harry V. **Daily development of kernels of Hannchen barley from flowering to maturity at Aberdeen, Idaho.** Jour. Agric. Res. 19: 393–429. *Pl. 83–91, 17 fig.* 1920.—Records were taken at intervals of 12 hours. Appreciable differences occur in these intervals except near maturity. The time from flowering to maturity for 3 successive years was 26

days. Growth in length is completed by the seventh day, and as soon as the rate of growth in length decreases, the thickness shows its most rapid increase. The dorsiventral diameter increases almost until maturity.—Increase in dry matter and decrease in percentage of water are very uniform throughout the period of growth. During growth the carbohydrates increase most rapidly and the ash content least rapidly.—"There are several well-marked steps in development. About the fifth or sixth day after flowering the growth in length is checked, and a rapid gain in dry matter begins. About the ninth or tenth day a sticky substance is secreted, which causes the glumes to adhere to the kernel. About the fifteenth or sixteenth day the kernel toughens, the lemma begins to lose color in the dorsal surface, some of the awns drop off, and the kernel has reached its maximum water content."—*D. Reddick.*

1416. Harlan, Harry V., and Stephen Anthony. **Development of barley kernels in normal and clipped spikes and the limitations of awnless and hooded varieties.** Jour. Agric. Res. 19: 431–472. *13 fig.* 1920.—Experiments in clipping awns of Hannchen and Manchuria barleys showed that at maturity both lateral and dorsiventral diameters of kernels from clipped spikes are smaller than those of normal spikes. This is not due to wound effects since rate of growth in clipped spikes is normal until the latter half of the growth period. The function of the awn as a transpiration organ is indicated by yields of awned and awnless sorts in arid as contrasted with humid areas. Awnless and hooded barleys shatter more easily than awned sorts. Clipped spikes also shatter easily. The authors find that the ash constituents that normally go into the awn are deposited in the rachis instead. They conclude that since the awn is removed it cannot function as a storage organ, and the consequent deposition of ash in the rachis causes brittleness. High yielding hooded or awnless sorts can hence be expected only by selection or hybridization in strains having low ash content in the rachis. They suggest the substitution of smooth awned varieties as lacking the objectionable features of the rough awned sorts.—*F. P. Bussell.*

1417. Headley, F. B. **The work in 1918 of the Newlands (formerly the Truckee-Carson) reclamation project experiment farm.** U. S. Dept. Agric. Dept. Circ. 80. *18 p., 1 fig.* 1920.—Discussion of variety and cultural tests of field crops, as alfalfa, barley, corn, oats, wheat and potatoes, and reports of results of experiments in the reclamation of alkali soil. Data are given concerning various horticultural crops, including sweet corn and string beans, and the blossoming periods of various fruit trees.—*L. R. Hesler.*

1418. Henke, L. A. **Corn at the College of Hawaii Farm.** Hawaiian Forester and Agric. 16: 40–45. 1919.—The failure of the ordinary American varieties of corn on the lower lands of the territory led to this attempt to find or develop a variety which would prove a sure crop on the low lands. Cuban corn was the outstanding variety. The variety does not possess an absolute immunity to leaf hoppers, but in only a few cases did they materially lessen the yield. An additional advantage lay in the fact that the husks surrounded the ears so completely and so tightly that bird or weevil injury did not appear until long after maturity, even in fields not harvested. In a country where the grain weevil is so common as in Hawaii, this is an extremely valuable characteristic. The yields ran from 30 to 57 bushels per acre, the larger yields appearing in the October plantings. Next in value came the Guam corn, which has been grown successfully on the Island of Kauai for some years. As the husks of this variety tend to open before the ears mature, it is more liable to bird and weevil injury than is the Cuban corn.—*Stanley Coulter.*

1419. Hibbard, R. P., and S. Gershberg. **The biological method of determining the fertilizer requirement of a particular soil or crop.** Michigan Acad. Sci. Ann. Rept. 21: 223–224. 1919.—Since the fertilizer requirement of a crop can not be determined by an analysis of either the soil or the crop, the requirement must be studied by growing the crop on the particular soil. This is called the biological method. Attention is called to the fact that the great majority of fertilizer experiments have not been planned on a logical, systematic method and that the combinations of fertilizer salts have been greatly restricted, and selected at random. The triangular system is advocated for field work. Field studies have been going

on for several years. Different soils and different crops have been investigated. It is suggested that plants growing for three or four weeks in pot cultures in the greenhouse could be used, according to the plan devised, to determine the proper treatment of the soil in the field. This work could be done in the winter months. Truck growers who use large greenhouses have an excellent chance to test out the proposed method. The article concludes with emphasizing the necessity of improving the present practice in the utilization of fertilizer in plant production. More exact knowledge is needed as to the best salts to combine and as to the best ratios of these salts.—*H. C. Young.*

1420. Jenkins, E. H., W. L. Slate, D. F. Jones, and B. A. Brown. **Varieties and strains of corn for Connecticut.** Connecticut (New Haven) Agric. Exp. Sta. and Storrs (Connecticut) Agric. Exp. Sta. Joint Bull. 3. *15 p.* 1919.—A report of progress in testing the prominent varieties and strains of corn for yields of grain and silage.—*Henry Dorsey.*

1421. Judd, C. S. **Morning glory weed.** Hawaiian Forester and Agric. 16: 4–5. 1919.—Notes occurrence of this pest in two localities along Kahului Railway. The area involved is very small, and efforts to bring about the complete eradication of the weed will probably prove successful.—*Stanley Coulter.*

1422. Leape, H. M., and H. E. Annett. **Investigations concerning the production of Indian opium for medical purposes.** Agric. Jour. India 15: 124–134. 1920.—A study was made of the morphine content of different varieties of opium grown under varying climatic conditions. Nitrogenous substances were the only fertilizing materials which resulted in increased production. Sodium nitrate increased the size of capsules and the amount of latex, but did not increase the percentage of morphine in the opium. The number of capsules borne on a plant is correlated with the morphine content of the opium produced. The terminal capsules are richer in morphine than the lateral ones, the difference varying from 2 to 7 per cent. About 500 varieties were examined for their morphine content and were found to vary from 6.5 to 20.5 per cent. The material produced from the first lancings of the poppy capsules had a higher morphine content than that produced from succeeding lancings.—*J. J. Skinner.*

1423. Letteer, C. R. **The work of the San Antonio experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 73. *38 p., 4 fig.* 1920.—The report includes discussion of topics as follows: Crop conditions; effect of rotation and tillage on cotton root-rot; experiments with and notes on cotton, corn, oats, Sudan grass, cowpeas, sorghums, flax, bean varieties, Rhodes grass, fruits and ornamental plantings; experiments in cotton root-rot control, under the headings, soil treatment, mulches, and excavations.—*L. R. Hesler.*

1424. Lovejoy, P. S. **Farms vs. forests.** Michigan Acad. Sci. Ann. Rept. 21: 201–212. 1919.—See Bot. Absts. 6, Entry 1559.

1425. Nelson, J. C. [Rev. of: Hitchcock, A. S. **The genera of grasses of the United States, with special reference to the economic species.** U. S. Dept. Agric. Bull. 772. *307 p., 20 pl., 174 fig.* Government Printing Office: Washington, 1920. Price $.40.] Torreya 20: 84–88. 1920.

1426. Parmentier, Paul. **Les irrigations et les arrosages en Syrie et en Palestine. [Irrigation in Syria and Palestine.]** Compt. Rend. Acad. Sci. Paris 169: 391–393. 1919.—See Bot. Absts. 6, Entry 1829.

1427. Parry and Company. **The development of cane planting by the East India distilleries and sugar factories.** Agric. Jour. India 15: 154–159. *2 pl.* 1920.—The yield and purity of sugar produced by a number of varieties of cane are given. The variety "Fiji B" produced 48 tons per acre, which was the largest yield secured. The purity of the sugar from this variety was also highest.—*J. J. Skinner.*

1428. Piper, C. V. **Kudzu.** U. S. Dept. Agric. Dept. Circ. 89. *7 p., 2 fig.* 1920.—Description of kudzu (*Pueraria thunbergiana*) with a discussion of culture, grazing and feeding value.—*L. R. Hesler.*

1429. Piper, C. V. **The jack bean.** U. S. Dept. Agric. Dept. Circ. 92. *12 p., 1 fig.* 1920.—A general discussion of the history, appearance, botany, culture, and pests of the jack bean (*Canavalia ensiformis*).—*L. R. Hesler.*

1430. Rindl, M. **Vegetable fats and oils. III. Drying oils (continued).** South African Jour. Inst. 3: 256–265. 1920.—Article treats of the sunflower, mainly in reference to its oil. The culture, soil preferences, varieties, harvesting, and utilization are discussed, and analyses of South African grown seeds are given. The culture of the plant in Rhodesia is also discussed in reference to effect of fertilizers, and use as a rotation crop with maize. Some commercial data regarding sunflower seeds are included. Brief notes are also added concerning *Madia sativa*.—*C. V. Piper.*

1431. Schreiner, Oswald, B. E. Brown, J. J. Skinner, and M. Shapovalov. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84: 3–35. *25 fig.* 1920.—(Report on investigations (field and greenhouse) of the effects of anhydrous borax in potato and cotton fertilizers. "Practically all the evidence collected points to the use in fertilizers of potash salts containing borax in what proved in practice to be excessive quantities. The higher the potash content of such mixed fertilizers the higher was also the borax content and the greater the damage to the crop." The appearance of the injury to potatoes and cotton is thus described: "In slight cases the foliage is lighter green than normal, while severely affected plants show leaves slightly rimmed, like a pond-lily leaf, this rim being bleached white or yellowish, so that the effect of borax-containing fertilizers has been rather aptly called 'gilt-edged.' In more extreme cases the leaves may be completely bleached, but they are rarely found in the field, as such badly affected plants die soon after emerging from the soil. With wheat and corn this bleached leaf is the more usual characteristic. It is not thought that permanent damage has resulted on fields subjected to this borax trouble. "There may be a cumulative effect, but there is no evidence on this question." Should borax continue to be used as an ingredient of fertilizer materials, even in moderate quantities, it will become an important duty of those responsible for fertilizer experimentation to test this possible cumulative action by a well planned long-term fertilizer experiment." Studies indicate that 2–3 pounds of borax to the acre will injure wheat and 8–9 pounds affect cotton. These quantities are small when compared to those of other poisons, as arsenic, mercury and copper. The extremely poisonous action is not readily explained. Borax is a strong antiseptic, and a partial explanation might be sought in the sterilizing action which it may have on the soil, but the authors think the specific physiological reactions of the plant would suggest a more intimate connection with the growing functions of the plant itself. Possibly borax also interferes with the liberation of sugars, thus disturbing the processes of germination and growth. Borax may also prove to be antizymotic. Notes on general conditions of health of potatoes in Maine are given.—*L. R. Hesler.*

1432. Ryan, P. **Flax and its cultivation.** Jour. Dept. Agric. Victoria 18: 257–266. 1920.—Cultural requirements, seeding, manuring, and harvesting are discussed. Up to the present flax has been grown in Australia for fiber exclusively.—*J. J. Skinner.*

1433. Truax, Hartley E. **United States grades for potatoes.** U. S. Dept. Agric. Dept. Circ. 96: 2–4. 1920.

1434. Truax, Hartley E. **United States grades for sweet potatoes recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. 99: 2–4. 1920.

1435. Venkatraman, T. S. **Packing seed sugar canes for transport.** Agric. Jour. India 15: 174–180. *3 pl.* 1910 —Directions for packing are given, together with a general discussion.—*J. J. Skinner.*

1436. Westover, H. L. **The development of the Peruvian alfalfa industry in the United States.** U. S. Dept. Agric. Dept. Circ. 93. *8 p., 2 fig.* 1920.

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Lincoln W. Riddle, *Editor*

1437. Anonymous. **Casimir de Candolle.** Kew Bull. Misc. Inf. [London] 1919: 237–238. 1919.

1438. Anonymous. **Dr. Frank Shipley Collins.** Rhodora 22: 96. 1920.—Notice of the death of this former president of the New England Botanical Club and member of the Editorial Staff of Rhodora, on May 25 at New Haven, Connecticut, in his seventy-third year.—*James P. Poole.*

1439. Anonymous. **Mrs. M. A. Sargent.** Kew Bull. Misc. Inf. [London] 1919: 390. 1919.

1440. Anonymous. **A Shakespearean garden.** Nature 104: 441–442. 1920.—Note upon plan to restore the garden of Shakespeare's birthplace with the flowers of his period. Comment upon suitable plants, and reference to some publications containing pertinent information.—*O. A. Stevens.*

1441. Anonymous. **Prof. J. W. H. Trail.** Kew Bull. Misc. Inf. [London] 1920: 32–33. 1920.—Additions to the list of publications by Trail given in Kew Bull. 1919: 381.—*E. Mead Wilcox.*

1442. Anonymous. **John H. Wilson.** Kew Bull. Misc. Inf. [London] 1920: 71. 1920.

1443. Barber, C. H. **The origin of sugar cane.** Internat. Sugar Jour. 22: 249–251. 1920.

1444. Bessey, E. A. **Guide to the literature for the identification of fungi—a preliminary outline for students and others.** Michigan Acad. Sci. Ann. Rept. 21: 287–316. 1919.—See Bot. Absts. 6, Entry 1911.

1445. Borén, P. G. **Utgifningsåren af Svensk Botanik [Dates of publication of "Svensk Botanik."]** Bot. Notiser [Lund] 1920: 63–64. 1920.—The year of publication is given for each part of each volume of the illustrated work, together with the numbers of the plates contained in each.—*P. A. Rydberg.*

1446. Correvon, H. **L'horticulture russe sous le régime bolcheviste. [Russian horticulture under the bolshevist régime.]** Rev. Hortic. [Paris] 92: 18–19. 1920.—General discussion concerning the fate of individuals. Destruction and neglect of some of the more important botanic gardens.—*E. J. Kraus.*

1447. Coulter, J. M. **Aaron Aaronsohn.** Bot. Gaz. 68: 388–389. *1 fig.* 1919.—A short biographical sketch with portrait.—See also Bot. Absts. 6, Entry 904.

1448. D(unn), S(tephen) T. **William James Tutcher.** Kew Bull. Misc. Inf. [London] 1920: 136–138. 1920.

1449. Eberle, E. G. **Henry George Greenish. Sketch with portrait.** Jour. Amer. Pharm. Assoc. 9: 665–666. 1920.

1450. Freeman, W. E. **British botanic gardens and stations.** Nature 104: 469. 1920.—Reference to early desire for such work in the West Indies shown in 1762 and the foundation of the St. Vincent garden.—*O. A. Stevens.*

1451. Fries, Rob. E. **Några drag ur den Bergianska trädgårdens historia 1885–1914. [Some outlines from the history of Hortus Bergianus 1885–1914.]** Acta Horti Bergiani [Stockholm] $6^1$: 5–24. *106 pl., 2 maps.* 1918.

1452. [Fries, Rob E.] **Veit Brecher Wittrock. In memoriam.** Acta Horti Bergiani [Stockholm] $6^1$: 3. 1918. Portrait.

1453. G(rove), W. B. **George Stephen West.** Kew Bull. Misc. Inf. [London] 1919: 314–315. 1919.—See also Bot. Absts. 6, Entry 56.

1454. Lesourd, F. **Les plantes potagères à travers les âges.** [Culinary plants grown in various centuries.] Rev. Hortic. [Paris] 92: 12–13. 1920.—See Bot. Absts. 6, Entry 1157.

1455. Lloyd, C. G. **J. Ramsbottom.** Mycological Notes 57: 830. April, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1456. Lloyd, C. G. **Arthur Lister.** Mycological Notes 58: 814. March, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1457. Lloyd, C. G. **George Francis Atkinson.** Mycological Notes 59: 846. June, 1919. [Cincinnati, Ohio.]—A biographical sketch with portrait.

1458. MacCaughey, V. M. **History of Botanical Exploration in Hawaii.** Hawaiian Forester and Agric. 16: 25–28. 1919. Sketches of work of Asa Gray and Brackenlidge in connection with U. S. Exploring Expedition; of Didrichsen's visit in 1845–47, his collections in the main being now at Copenhagen; of Berthold Seemann, whose name will always be associated with the botany of the Pacific, who visited the Islands on the voyage of the "Herald," 1847–51; of Jules Rémy who, in his two visits, 1851–63, made notable collections of the Hawaiian flora; of Mann and Brigham in 1864–65; and finally of Wawra, the botanist of the Austrian East Asiatic Exploring Expedition of 1869. Valuable because of bibliography and location of collections.—*Stanley Coulter.*

1459. MacCaughey, V. M. **History of Botanical Exploration in Hawaii.** Hawaiian Forester and Agric. 16: 49–54. 1919.—A conclusion of the series of articles together with a complete bibliography. Especial attention is given to the work of William Hillebrand, "Hawaii's greatest botanist." Others included are Rev. J. M. Lydgate, Edward Bailey, A. A. Heller, H. Schauinsland, and Miss Josephine Tilden. The fifty-two titles in the bibliography include "A Voyage to the Pacific Ocean," Captain James Cook (1784); "Voyage autour du monde," M. Marchand (1798); and Vancouver's "A Voyage of Discovery to the North Pacific Ocean and around the World" (1798).—*Stanley Coulter.*

1460. McFarland, J. Horace. **Roses remade for America.** Garden Mag. 31: 93–98. 1920.—See Bot. Absts. 6, Entry 1168.

1461.—Mackenna, J. **Dr. C. A. Barber.** Agric. Jour. India 15: 11–15. *1 pl.* 1920.—Life history.

1462. Mangin, Louis. **Notice nécrologique—Émile Boudier.** [Obituary of Emile Boudier.] Compt. Rend. Acad. Sci. Paris 170: 417–418. 1920.—Mycologist, 1828–1920; pupil of Levéille; specialist in Discomycetes; doctor of pharmacy; residence at Montmorency.—*C. H. and W. K. Farr.*

1463. Mangin, L. **Notice sur M. William Gilson Farlow. [Note concerning William Gilson Farlow].** Compt. Rend. Acad. Sci. Paris 169: 445–448. 1919.—A review of the life and works of William Gilson Farlow. [See also Bot. Absts. 6, Entries 916, 947, 956, 963, and 1470.]—*V. H. Young.*

1464. [Nordstedt, O.] [Rev. of: Bryk, F. **Caroli Linnaei Adonis Stenbroensis.** *xiii+28 p., 2 maps.* 1920.] Bot. Notiser [Lund] 1920: 61. 1920.—The printing of an unpublished manuscript of Linnaeus—a catalogue of the plants growing in his father's garden—written in 1731 and 1732.—*P. A. Rydberg.*

1465. Nordstedt, O. **Prima loca plantarum Suecicarum.** Bot. Notiser [Lund] 1920 (Bilaga): 1–64. 1920.

1466. Phillips, E. P. **A brief analysis of the work of Carl Thunberg on the Proteaceae.** South African Jour. Sci. 16: 380–382. 1920.—Thunberg collected 79 species of Proteaceae, but recognized only the genera *Protea* and *Brabieum.* Thunberg described 84 species.—*E. P. Phillips.*

1467. Ritzema Bos, J. **Bij den aanvang van den 26 sten jaargang. [Beginning the twenty-sixth year of the Tijdschrift.]** Tijdschr. Plantenz. 26: 1–4. 1920.—An editorial announcement. The Tijdschrift is to appear monthly instead of bi-monthly as in the past. It is to be the semi-official organ of the Phytopathological Service of Holland. A complete index of the first 25 volumes of the Tijdschrift is to be published. Authors and titles of a number of leading articles to appear in volume 26 are given, and an appeal is made for increased membership in the society and funds for the journal.—*H. H. Whetzel.*

1468. Russell, E. J. **Dr. Cyril G. Hopkins.** Nature 104: 442–44 . 1920.—Reference to his death and brief survey of his work.—*O. A. Stevens.*

1469. S(kan), S(idney) A(lfred). **Sir William MacGregor.** Kew Bull. Misc. Inf. [London] 1920: 31–32. 1920.

1470. W(akefield), E(lsie) M(aud). **William Gilson Farlow.** Kew Bull. Misc. Inf. [London] 1919: 388–390. 1919.—See also Bot. Absts. 6, Entries 916, 947, 956, 963 and 1463.

1471. Wilson, E. H. **The romance of our trees. VII. The beeches.** Garden Mag. 31: 115–119. *4 fig.* 1920.—Discusses history, distribution, characteristics of the different species, mentions celebrated specimens, celebrated groves and forests of beeches.—*H. C. Thompson.*

1472. Wilson, E. H. **The romance of our trees. IX. Whence came the common fruits.** Garden Mag. 31: 259–263. 1920.—Discusses the origin of apples, pears, peaches, plums, cherries, and apricots.—*H. C. Thompson.*

1473. Wilson, E. H. **The romance of our trees. X. The Lombardy poplar and the Babylon willow.** Garden Mag. 31: 317–320. *5 fig.* 1920.

## BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Alfred Gundersen, *Assistant Editor*

1474. Anonymous. **Kursus for Skogbrukslärlinge. [Courses of study for beginners in forestry.]** Tidsskr. Skogbruk 28: 123–125. 1920.—Announcement of establishment, organization, and administration of the schools. No list of courses.—*J. A. Larsen.*

1475. Anonymous. **Tropical agricultural college in the West Indies.** Kew Bull. Misc. Inf. [London] 1920: 81–96. 1920.

1476. BROWN, ELIZABETH DOROTHY WUIST. **The value of nutrient solutions as culture media for fern prothallia.** Torreya 20: 76–83. *2 fig.* 1920.—The work of growing fern prothallia for class use is greatly simplified by the use of nutrient solutions. The following were found useful in the germination and development of various Polypodiaceae; BEIJERINCK'S, BIRNER and LUCANUS'S, KNOP'S, PRANTL'S, SACHS'S. The composition of each is indicated. It is best to make a liter of the solution, which it is not necessary to sterilize. Glass capsules holding about 26 cc. are best suited for solution cultures. Ferns with monoecious prothallia are best adapted for the work. After drying, the sporangia are crushed and the spores separated with bolting-cloth. After the cultures are made, they should be exposed to direct sunlight. The optimum temperature for prothallia is 60° F.—*J. C. Nelson.*

1477. PHILLIPS, E. P. **The importance of a properly equipped state herbarium to an agricultural country.** South African Jour. Nat. Hist. 2: 18–39. 1920.

## CYTOLOGY

GILBERT M. SMITH, *Editor*

G. S. BRYAN, *Assistant Editor*

1478. ALLEN, EZRA. **Studies on cell division in the albino rat (Mus norvegicus var. alb.). III. Spermatogenesis: the origin of the first spermatocytes and the organization of the chromosomes, including the accessory.** Jour. Morph. 31: 133–185. *58 fig.* 1918.—See Bot. Absts. 5, Entry 1421.

1479. CHURCH, A. H. **Historical review of the Florideae. II.** Jour. Botany 57: 329–334. 1919. (Continued from IBID. 57: 304.)—See Bot. Absts. 5, Entry 598.

1480. CONKLIN, E. J. **The mechanism of evolution.** Sci. Monthly 10: 392–403, 496–515. 1920.—See Bot. Absts. 5, Entries 1986, 1987.

1481. DANGEARD, P. A. **La structure de la cellule végétale et son métabolisme. [The structure of the plant cell and its metabolism.]** Compt. Rend. Acad. Sci. Paris 170: 709–714. 1920.—A comparison of the three categories of chondrial elements of GUILLIERMOND with the three categories of the author. He criticizes GUILLIERMOND for including under the term mitochondria all cell elements giving the mitochondrial reaction, regardless of their origin or development. He repeats his contention that anthocyan and tannins are formed from the metachromatic bodies of the vacuome.—*C. H.* and *W. K. Far.*

1482. DELAGE, Y., AND M. GOLDSMITH. **Le mendelisme et le mécanisme cytologique de l'hérédité. [Mendelism and the cytological mechanism of heredity.]** Rev. Sci. Paris 57: 97–109, 130–135. 1919.—See Bot. Absts. 5, Entry 1483.

1483. DE WINIWARTER, H. **Les mitoses de l'épithélium séminal du chat. [Mitoses of the seminal epithelium of the cat.]** Arch. Biol. 30: 1–87. *1 pl., 34 fig.* 1919.—See Bot. Absts. 5, Entry 351.

1484. DONCASTER, L., AND H. G. CANNON. **On the spermatogenesis of the louse (Pediculus corporis and P. capitis), with some observations on the maturation of the egg.** Quart. Jour. Microsc. Sci. 64: 303–328. *1 pl., 1 fig.* 1920.—See Bot. Absts. 5, Entry 1489.

1485. GATENBY, J. BRONTÉ. **The cytoplasmic inclusions of the germ-cells. VI. On the origin and probable constitution of the germ-cell determinant of Apanteles glomeratus, with a note on the secondary nuclei.** Quart. Jour. Microsc. Sci. 64: 133–153. *1 pl., 10 fig.* 1920.—See Bot. Absts. 5, Entry 378.

1486. GOLDSMITH, WILLIAM M. **A comparative study of the chromosomes of tiger beetles (Cicindelidae).** Jour. Morph. 32: 438–487. *Pl. 1–10.* 1919.—See Bot. Absts. 5, Entry 382.

1487. Guilliermond, A. **Sur le chondriome et les formations ergastoplasmiques du sac embryonnaire des Liliacées. [On the chondriosome and the ergastoplasmic formations of the embryosac of lilies.]** Compt. Rend. Acad. Sci. Paris 169: 300–303. *4 fig.* 1919.—Author figures and describes the formation and nature of mitochondria, chondriosomes, and "ergastoplasmic" bodies in the embryo-sac of *Lilium croceum* and *L. candidum*.—*V. H. Young.*

1488. Lillie, Frank Rattray. **Problems of fertilization.** *13 × 19 cm., xii + 278 p., 19 fig.* Univ. Chicago Press: Chicago, 1919.—See Bot. Absts. 5, Entry 410.

1489. Metz, Chas. W. **Correspondence between chromosome number and linkage groups in Drosophila virilis.** Science 51: 417–418. 1920.—See Bot. Absts. 5, Entry 1582.

1490. Miller, E. C. **Development of the pistillate spikelet and fertilization in Zea mays L.** Jour. Agric. Res. 18: 255–265. *Pl. 19–32.* 1919.—See Bot. Absts. 5, Entry 569.

1491. Morgan, T. H. **The physical basis of heredity.** *14 × 21 cm., 300 p., 117 fig.* J. B. Lippincott Co.: Philadelphia, 1919.—See Bot. Absts. 5, Entry 422.

1492. Morgan, T. H., and C. B. Bridges. **Contributions to the genetics of Drosophila melanogaster. I. The origin of gynandromorphs.** Carnegie Inst. Washington Publ. 278. *122 p., 4 pl., 10 fig.* Washington, D. C. 1919.—See Bot. Absts. 5, Entry 424.

1493. Nakahara, Waro. **A study on the chromosomes in the spermatogenesis of the stone-fly, Perla immarginata Say, with special reference to the question of synapsis.** Jour. Morphol. 32: 509–529. *3 pl.* 1919.—See Bot. Absts., 5, Entry 429.

1494. Schaffner, J. H. **The expression of sexual dimorphism in heterosporous sporophytes.** Ohio Jour. Sci. 18: 101–125. *25 fig.* 1918.—See Bot. Absts. 5, Entry 1627.

1495. van Wisselingh, C. **Über Varibilität und Erblichkeit. [Concerning variability and heredity.]** Zeitschr. indukt. Abstamm. Vererb. 22: 65–126. *10 fig.* 1920.—See Bot. Absts. 5, Entry 1679.

1496. Zeleny, C. **The method of procedure in the analysis of heredity.** Sci. Monthly 11: 263–275. 1920.

## ECOLOGY AND PLANT GEOGRAPHY

H. C. Cowles, *Editor*

Geo. D. Fuller, *Assistant Editor*

### GENERAL, FACTORS, MEASUREMENTS

1497. Brenchley, Winifred E. **Some factors in plant competition.** Ann. Appl. Biol 6: 142–170. *Pl. 5, 10 fig.* 1919.—The writer, at the Rothamsted Station, used barley and mustard plants in a study of competition for food from the soil, for water, and for light. When the food supply is limited, the amount of nitrogen was found to determine the amount of growth, and the dry weight was found to be about the same per pot, regardless of the number of plants grown.—When there is competition for light in overcrowding, barley plants produced a smaller number of ears, an irregular number of tillers, a reduced amount of dry matter, and a proportionately larger ratio of shoot growth as compared with root growth. Crowded plants had a decreased power of utilising the food supplied to the roots. Adequately illuminated barley plants tended to grow toward a standard type of plant. With crowding, this approximation to a standard disappeared.—*G. R. Bisby.*

1498. Cribbs, James E. **Ecology of Tilia americana. I. Comparative studies of the foliar transpiring power.** Bot. Gaz. 68: 262–286. *13 fig.* 1919.—In the dune region of Indiana *Tilia americana* is found growing in a variety of habitats ranging from mesophytism to rather

extreme xerophytism. Cribbs has measured the factors of these habitats, including temperature, evaporation, humidity, soil moisture, and soil temperature, and has presented his results in a series of graphs exhibiting the range of mesophytism characteristic of the different habitats. In each of these habitats he has measured the foliar transpiring power of leaves of the same age and similar position, using the cobalt chloride paper method. These results are presented in graphs which express as some of the most notable of the results: (1) The foliar transpiring power increases from that indicated by an index of 0.15 in the mesophytic forest situation to that with an index of 0.55 in the most exposed situation on the open sand. (2) In the forest the daily march of relative transpiration is represented by a curve with a single mode developing about midday and coinciding with the maxima of temperature, relative humidity, and evaporating power of the air. (3) In more exposed situations the transpiration curve becomes bimodal, with the maximum appearing earlier in the day than the maxima of temperature, relative humidity, and evaporation. (4) The second mode developing in the afternoon is always lower than the mode preceding the depression due to saturation deficit. (5) No evidence of visible wilting occurred in *Tilia* on the open sand at any time during the summer, although the so-called "incipient drying" was a common feature of the stations throughout this period. On the forested complex, however, visible wilting occurred during the first week of August because the vegetation was so dense that the water content of the soil was reduced quite early to a point below the wilting coefficient. (6) The amount of water in the soil apparently has very little influence on the transpiration index unless it is reduced to the wilting coefficient. The saturation deficit depression is due to the inability of the translocating system to conduct water to the leaves with sufficient rapidity to offset the transpiration loss—*Geo. D. Fuller.*

1499. GLEASON, HENRY ALLAN. **Some applications of the quadrat method.** Bull. Torrey Bot. Club 47: 21–33. 1920.—The quadrat method constitutes the only practical means for quantitative study of the plant association and is of great importance in correcting the deficiencies of written description and photography. There are quadrats of various types: a simple list of species, the number of individuals of each species, and the map type in which a chart is prepared on scale. A single quadrat is apt to give a one-sided picture of an association because of lack of homogeneity within the association; the chief value in this method, then, lies in the use of many quadrats, the size of which must be determined by the general character of the vegetation. The first quadrat used can be located anywhere; succeeding ones can be at definite distances from the first to avoid personal choice. At the conclusion of the count, the ratio between the total number of quadrats and the number in which a given species occurs is expressed as a percentage which is known as the *frequency index* (FI). Some rarer species will thus be missed entirely, but those of actual importance in the association will be counted. There is a definite relation between the number of individuals of a species and its frequency index. If $n$ plants are scattered at random over $q$ quadrats the probability of any one quadrat being occupied is expressed by the formula $1 - \left(\frac{1-1}{q}\right)^n$. But since plants are not distributed entirely at random, the actual number is greater than indicated by the mathematical formula. Since the frequency index increases with the size of a quadrat, a *major quadrat* may be chosen which will normally include all the more important species. The proper size of this major quadrat may be determined by reducing the original series of quadrats to a smaller number of larger ones by substituting in the formula $FI = 1 - (1 - \frac{1}{q})^n$, for $q$ the number of quadrats actually counted, and for *FI* the index of the least common of the important species. Jaccard's *community coefficient* is shown to be unsatisfactory in allowing equal weight to small slender plants and to larger ones; it might be improved by a multiplier expressive of size.—*P. A. Munz.*

1500. MCLEAN, R. C. **Studies in the ecology of tropical rain forests, with special reference to the forests of South Brazil.** Jour. Ecol. 7: 121–172. *10 fig.* 1919.—This report continues the account of the rain forest near Rio de Janeiro, Brasil, already noted (see Bot. Absts.

4, Entry 196). This forest is regarded as the climax type for a large portion of the adjacent country. A biological spectrum of the Raunkiaer type would show an enormous preponderance of woody plants arranged in three distinct strata, the ground cover being comparatively bare of herbaceous vegetation. There is a great diversity of species, with the Leguminosae as the most prominent family and the Rubiaceae and Piperaceae particularly abundant among the shrubs. Ferns and lycopods are largely limited to rocky spots. Conspicuous and highly colored flowers are abundant in the upper canopy and notably lacking below. Buttressed tree trunks are rare in spite of the frequency of violent winds but thorny stems are frequent even in large trees. The floristic diversity and the contrasting uniformity of appearance especially in leaf form are ascribed to (1) the antiquity of prevailing conditions and (2) the peculiarity of the environment. The soil is shallow and pervious, with a water holding capacity of about 40 per cent and an average water content of 10 per cent. It is deficient in mineral nutrient material, particularly in calcium carbonate. The humus content is about 3 per cent. Mycorhiza is very abundant. A very considerable amount of rain is intercepted by foliage and evaporated into the air, thus reducing the rainfall efficiency. Light measurements made with photographic exposure meters show the average ratio of the light outside and that within the deep forest to be 1: 0.06; some spectroscopic measurements, however, tend to show that the photosynthetic efficiency of the shade illumination is relatively greater than the actinic.—The leaves of the forest are in general characterized by their large size, the small number per plant, and the frequency of nyctitropic movements and of vertical position. The shade leaves show conspicuous water storing epidermis, reduced and undifferentiated mesophyll and occasional epidermal papillae. The leaf area of the sun foliage is approximately the same as that of the shade leaves, but the latter are decidedly larger and narrower. Red coloration is common in the young shade leaves, and such leaves are shown to have a higher rate of respiration. The percentage of carbon dioxide within the forest is shown to be high, and here light is doubtless the limiting factor of photosynthesis. —*Geo. D. Fuller.*

1501. Watt, A. S. **On the causes of failure of natural regeneration in British oakwoods.** Jour. Ecol. 7: 173–203. 1919.—The investigation was conducted in the vicinity of Cambridge England, and the report is presented in three parts, dealing respectively with the acorn, its germination, and the seedlings. The rapid disappearance of even a large crop of acorns from the forest floor is seen to be largely due to the action of rabbits and mice. The drying of the acorn to an extent that results in the loss of 20 per cent of its water is found to prevent subsequent germination. Experiments were conducted to discover the amount of imbedding in the soil necessary for good germination, and in general it was found that at least one-half of the nut should be below the surface; on the other hand burial to depths ranging from 3 to 9 inches in sandy or clay soil gave equally good germination. Rabbits, mice, and larger grazing animals are shown to destroy very large percentages of the seedlings during the first few years of their existence. One of the mildew fungi proved rather destructive, especially on the sandy soils. Emphasis is placed on the fact that by destroying carnivorous animals man has upset the balance of nature and favored the enemies of forest regeneration. The chances of good regeneration decrease on passing from the "damp oak association" to the "dry oak association," and from the latter to the "oak-birch heath."—*Geo. D. Fuller.*

## STRUCTURE, BEHAVIOR

1502. Betts, M. Winifred. **Notes on the autoecology of certain plants of the Peridotite Belt, Nelson [New Zealand]: Part I. Structure of some of the plants (No. 2).** Trans. and Proc. New Zealand Inst. 51: 136–156. *27 fig.* 1919.—The region studied is about thirty square miles in area, with a vegetation of xerophytic shrubs and grassland. A detailed description is given of the growth-forms, and of the anatomy of the leaf and of the stem, of fifteen characteristic plants.—*L. W. Riddle.*

1503. HARPER, ROLAND M. **Water and mineral content of an epiphytic fern.** Amer. Fern Jour. 9: 99–103. 1919.—Epiphytic ferns probably get some of the inorganic matter from the bark of trees on which they grow as well as from dust. Three hundred and forty grams of *Polypodium polypodioides* were collected shortly after a rain. The plants were chopped up, and after remaining at a temperature of 46°C. for about a week were again weighed. The dry weight was about 42 per cent of the fresh weight. When some of the desiccated material was burned, it was found to contain 5 per cent ash. A partial analysis of the ash showed 27 per cent of potash and ½ of 1 per cent of soda.—*F. C. Anderson.*

1504. HAVILAND, F. E. **The stomata of the leafless plants of the interior [Australia].** Australian Nat. 4: 107–110. 1919.—The arrangement, number, and location of the stomates in a number of leafless plants of Australia. The stomates often appear to be unprotected against excessive transpiration.—*T. C. Frye.*

## VEGETATION

1505. ENGLER, A. **Die Vegetationsverhältnisse des Kongoa-Gebirges und der Bambuto-Berge in Kamerun [West Africa]. [The vegetation of the Kongoa Mountains and the Bambuto Mountain in Kamerun.]** Bot. Jahrb. 55 (Beiheft): 24–32. 1919.—Ledermann's Garua expedition (1808–09) had thrown much light on the relations of the alpine floras of western and eastern Africa. ENGLER wished to carry this study farther into the Kongoa and Bambuto Mountains.—Vegetation of the Kongoa Mts.: There are many plants of *Pachylobus edulis* in the forests of the foot-hills, also *Phoenix reclinata* and tree ferns. Above 1200 m. frequent fogs cause the trees to be covered with *Pilotrichella* and *Usnea*. The lianes are species of *Urera*, *Grewia*, etc. A list of plants in the forest at 1500 m. is given. The following are some of the epiphytes: *Polypodium lanceolatum*, *Oleandra articulata*, *Vittaria*, *Bulbophyllum*, *Viscum*, and *Megaclinium*. The forest floor is covered with Selaginellas, Peperomias, Polyspathas, Clinogynes, and other plants. On Mbo at an altitude of 1900 m. are fine examples of the Guinean rain forests; lists of the plants are given. Above Sanschu, at 1550 m. elevation, the forest becomes transformed into a pure stand of *Pennisetum purpureum* (elephant grass). On the declivities oil palms extend up to 1800 m. A list of the plants in the elephant-grass formation is given. Tree ferns are found on the stream banks here, according to Ledermann. This formation passes in drier situations to grass steppes with herbaceous Melastomaceae and other plants. At 1800 m. the alpine forest begins with low thin-stemmed gnarly trees and a few lianes, the most common of which is the araliaceous *Polyscias Preussii*. The typical plants on the eastern slope are listed. Vegetation of the Bambuto Mountains: From Djutitsa the trail leaves the culture-land and enters the grass steppes of the mountains. A list of plants is given of the Raphia region, where at the start this plant (*Raphia*) is common. The gradually rounded hills are covered with grass 1–1.5 m. high. A list of species in this grass formation at an altitude of 1700–1800 m. is given. Many of these plants have very beautiful flowers. At 2000 m. the steppe-flora becomes still more diverse, *Vigna Ledermannii*, *Polygala tenuicaule*, *Gmidia bambutana*, and other plants appearing. Especially rich are the mountain steppes at 2200 m. altitude. Here Ledermann discovered willows along the borders of brooks, and though these have been noted in a few other localities, this was an important geographical discovery. *Peucedanum Winkleri*, 2–3 m. high, is found here; also *Vernonia senegalensis*, 4–6 m. high. At 2000–3000 m. groups of Proteaceae appear. On the northwest slope at 2100–2300 m. is a low alpine forest. Here is found *Pteridium;* then *Vernonia senegalensis*. Labiatae, a 3 m. high *Lobelia*, *Spiraea*, *Ficus*, *Peperomia*, *Hypericum lanceolatum*, *Tephrosia*, and other plants gradually appear. Lianes and epiphytic orchids are rare in this region. At the edge of the forest, at an altitude of 1900–2500 m., *Ericinella mannii*, 5 m. high, is common and forms the Ericinella association. Here also is *Pteridium*, bushes of *Trifolium Goetzenii*, *Crotalaria oreadum*, *Calamintha sinensis*, and other species. In places very rich in humus *Hypericum Conrauanum*, 2–5 m. high, is found; also *Brillantaisia Schumanniana*, a splendid giant herb 4–5 m. high, *Impatiens Sakeriana*, and others. In dry open places the ericaceous *Blaeria bambutensis* appears.

In the primary forests of the gullies more lianes and more ferns are found. The most common tree is the myrsinaceous *Rapanea macrophylla*; but *Albizzia*, *Podocarpus*, and *Salix* are common. *Marattia fraxinea* was common on the damp forest floors, and also the little *Begonia bracteosa*. In dry places is *Cheilanthes farinosa*, the 2 m. high *Dryopteris Bergiana*, and the 1 m. high *Adiantum Poiretii*. Other plants in this region are listed. Gradually the gully woods pass over into the alpine forests. At an altitude of 2200 m. *Ficus chlamydocarpa*, 15 m. high, *Nuxia Ledermannii*, 8–10 m. high, and the liane *Gouania longispicata* are conspicuous. *Asplenium furcatum* is an epiphyte in this region.—*K. M. Wiegand.*

1506. Fleischer, M. **Die Moosvegetation im Urwald von Bialowies [Lithuania]. [The moss vegetation in the virgin forest of Bialowies.]** Bot. Jahrb. 55 (Beiheft): 113–124. 1919.—The forest is mainly undisturbed by man. Though the variations in altitude are slight, reaching an extreme of only 170 m., the conditions are very diverse, due to changes in the moisture and water level. Swampy forests on the lowlands give place on the sandy ridges to dry fir woods and Calluna heath, with alternating bogs and sphagnum moors between. The richest moss flora is in the damp upland mixed forest which is mainly composed of broad-leaved trees and firs. All the trees are more or less covered with epiphytic mosses and lichens, and the humus is generally covered deep with moss. There may be recognized a xerophytic bark moss formation requiring little food, and a more pretentious terrestrial formation, mainly mesophytic. A vivid account is given of the moss flora, bringing out the resemblances to the flora of central Europe and some of the differences. Many species are the same in both localities. The moss flora of the forest floor is richer than that in Germany. The bark formation and the ground formation are connected by the mosses living at the base of the trees as *Eurynchium strictum*, *Metzgeria furcata*, *Ptilidium ciliare*, etc. On the moors a few mosses are found among the carices, such as *Aulacomnium palustre* and *Calliergon stramineum*, mixed more or less with sphagnum. The relation of mosses to light is very interesting ecologically. Most prefer diffuse light to direct sunlight (skiophile), but this diffuse light may be too weak. Wiesner showed that below 1/70–1/90 the total shade begins, in which no moss can grow. The moss habit is a direct adaptation to the struggle for sufficient light. *Neckera pennata* shows this; so also does the intermittent story-like growth of the soil mosses, which are less dependent on the rainfall than on light. The rainfall theory is very poorly supported by the actual conditions. The story-like growth lets in light. Many mosses and liverworts in the tropics show this adaptation even better. Fan-shaped plagiotropic growth and sickle-shaped leaves are an adaptation against too strong light. Most shade mosses have a plagiotropic growth or horizontal branching. Curved capsules are probably not a response to light. *Anomodon* spp. seem to require the least light, and are found in the darkest woods, where their chlorophyll is still protected by the papillose cells. Even the protonema may be influenced by light, as in *Tetraphis pellucida*. Phototropic mosses are fewer, and are mostly wanting in the primitive forest. Many mosses are polyclinic, growing in light or shade, as *Polytrichum commune*. *Sphagnum* is light loving, but the chlorophyll is protected by a cell screen—a method found also in *Leucobryum*, and common in the tropics. The violet or brown colored walls in *Sphagnum* protect the plant against sunlight. The best examples of such protection are found among the tropical Neckeraceae and Hookeraceae, and among foliose liverworts. The struggle in the shade is for a light optimum; in the open it is against too much sunlight.—*K. M. Wiegand.*

1507. Laing, R. M. **The vegetation of Banks Peninsula [New Zealand], with a list of species [flowering plants and ferns].** Trans. and Proc. New Zealand Inst. 51: 355–408. 1919.—A general introductory discussion of the physiography, plant distribution, and associations of the region, is followed by an annotated list of species.—*L. W. Riddle.*

1508. Ledermann, C. **Einiges von der Kaiserin-Augusta-Fluss-Expedition [New Guinea]. [Notes on the Empress Augusta River Expedition.]** Bot. Jahrb. 55 (Beiheft): 33–44. 1919.—The expedition landed in February, 1912, at Madang, and travelled up the Sepik river, establishing a permanent base-camp about five kilometers above the village of Malu. The surrounding region included mountain slopes, alluvial woods, swamps, sago-swamps, pandanus

formations, and great flatlands of grass and lakes. The second-growth forest near the camp contained introduced yams, taro, tobacco, brakes, species of Jambosa, Gnetum, etc. Side trips were made to the "Zuckerhut," Mt. "Berges," April river, Mt. Pyramid, and the "Hunstein Spitze" by way of the river Sepik and the "Swartz" river. The vegetation is vividly described for each trip. Proteaceae 20 m. high were seen, along with Ficus trees 25–30 m. high. Ferns, selaginellas, climbing freycinetias and rhaphidophoras, epiphytic orchids, dracaenas, and narrow leaved pandanuses were seen in the more humid forests. Landslides and wind-falls were often covered with Scitamineae and Araceae. In places the soil was saturated and covered with a thick layer of moss. On the steep rocky slopes of the "Felspitze" the substratum caused an elimination of tree species, but *Ficus* spp. were common, as also *Macaranga* spp. Red seedlings of the latter were very numerous and conspicuous. The ficus roots have great power of penetration among the rocks, or even of splitting them. On the declivities the abundant terminalias with their phototropic tops looked, when viewed from above like a giant stairway. Monimiaceae, Symplocaceae, and Theaceae were abundant. The forest was so open in some places that epiphytes grew from the base to the crown of the trees. Ledermann spent a few weeks in the Marian, West Caroline, East Caroline, and Palau Islands before returning to Europe.—*K. M. Wiegand.*

1509. Newman, L. F., and G. Walworth. **A preliminary note on the ecology of part of the South Lincolnshire [England] Coast.** Jour. Ecol. 7: 204–210. 1919.—A survey of some 17 miles of salt marsh near the mouth of the River Witham, together with the areas reclaimed by the construction of a sea-wall some 70 years ago, is included in the report. The following associations are recognized and lists of species for each are given. (1) Bank zone, reclaimed land in permanent pasture grasses; (2) Bank-base zone, a narrow strip dominated by *Agropyrum junceum* and *Spartina stricta;* (3) *Festuca rubra* zone, in which there are associated with the dominant species *Spergularia salina* and *Glaux maritima;* (4) Intermediate zone, in which *Obione portulacoides* mingles with the species of the preceding association; (5) Obione zone, with *Obione portulacoides* and *Suaeda maritima;* (6) Festuca-Salicornia zone, at about high tide level, dominated by the genera indicated; (7) Salicornia zone, occupying the mud flats and having both annual and perennial species of the genus; and (8) Algae-Zostera zone, a rather narrow strip a quarter of a mile below high tide. Analyses of the various soils are given, and some of the main problems of the area are indicated.—*Geo. D. Fuller.*

1510. Pritzel, E. **Die Grettstadter Wiesen [Germany]. [The meadows of Grettstadt.]** Bot. Jahrb. 55 (Beiheft): 83–112. *1 map.* 1919.—The extensive meadows about Grettstadt are famous both for the abundance of showy flowers and richness in species. The underlying rocks are various, but mostly calcareous. The peat is little more than 1 m. thick. "Hochmoors" are not found, owing to the lime which prevents the growth of sphagnum. *Primula farinosa, Gentiana verna,* and other northern plants are supposed to be relics of the glacial migration, but this is questioned. The former plant and *Cirsium bulbosum* are very characteristic of this region. A description of the vegetation, with lists of species, is given under the following headings: I. Vegetation of the meadows. 1. The true meadows. 2. The depressions; (a) border ditches, (b) pockets of rushes. 3. Meadow shrubbery. Comparison with meadows of northern Germany. II. Forest; all deciduous, the predominating trees being *Quercus pedunculata* and *Fraxinus excelsior.* The undergrowth is rich and interesting. III. Water vegetation, in the "Unken" brook and water holes. IV. Vegetation on dry sandy soil; found in a few limited localities near the meadows. The transition zone between this vegetation and that of the meadow is interesting. V. Plants of the gypsum hills; these are predominatingly lime-loving plants. A few true calciphiles are lacking, probably due to a deleterious effect of the dolomite or gypsum; on the other hand a few of the plants present such as *Adonis vernalis, Astragalus danicus* and *Stipa capillata* seem to prefer gypsum. The scrub forests on the hillsides are interesting in their undergrowth.—*K. M. Wiegand.*

1511. Ramaley, Francis. **Subalpine lake-shore vegetation in north-central Colorado.** Amer. Jour. Bot. 7: 57–74. *6 fig.* 1920.—The physiography, climate, and soil of a subalpine area in north-central Colorado are recorded; and the lake-shore vegetation of a large number

of lakes, some morainal and some rock-basin in type, is described and discussed. Lists of species are presented, with soil-moisture index of each; and the various associations, with their successional relations and seasonal aspects, are described. Definite circum-areas are often developed. The succession leads from aquatic plants (which are few) through a well-developed moor (chiefly *Carex*), a heath association (chiefly *Kalmia* and *Gaultheria*), and a meadow association (chiefly *Erigeron*, *Castilleja*, *Ligusticum*, *Pedicularis* and *Vaccinium*) to the climax association of Engelmann spruce forest.—*E. W. Sinnott.*

1512. Rand, R. F. **Wayfaring notes from Great Namaqualand [Southwest Africa].** Jour. Botany 58: 53–55. 1920.—The author visited this region in October, 1919. A brief account of the vegetation is given. It is mainly xerophytic. Patches of desolate country are occupied by leafless Euphorbias, and species of Aloe are frequent. As most of the country is a stony, sandy desert, the vegetation is mainly confined to the river beds, where trees of considerable size, principally Acacias, may be found. *Gomphocarpus fruticosus*, an asclepiad, and a pestiferous weed in many parts of Africa, occurs here in profusion. The nature of the sand-rivers is described in some detail. The plants are the despair of collectors, as they are so difficult to press. They are, however, very beautiful when living and in flower.—*K. M. Wiegand.*

1513. Watson, W. **Habitats of Hypericum humifusum.** Jour. Botany 57: 353–354. 1919.—The author questions H. S. Thompson's statement in Jour. Botany that this plant is calciphile. He is inclined to agree with other botanists that it is calciphobe. May not its occurrence in limy regions be due to its shallow-rooted habit, the superficial layer of soil being acid? In one corn field, however, the author found the plant associated with calciphiles in such a way as to make an explanation difficult.—*K. M. Wiegand.*

## FLORISTICS

1514. Bertsch, Karl. **Wärmepflanzen im oberen Donautal [Germany]. [Warm temperature plants in the upper Danube Valley.]** Bot. Jahrb. 55 (Beiheft): 313–349. *6 fig.* 1919. In this study the more typically alpine plants were excluded, as well as those occurring sporadically. Rare plants in stone quarries and gravel beds have often come from a distance and should be excluded. As a rule no isolated plants are endemic. All introduced plants were excluded from the study as far as possible; this was difficult, as local introduction of native plants is common. Plants of general distribution were also excluded. There was left a small group of plants which over a circumscribed area inhabited all available places. These island-like areas were the only infallible assurance of truly indigenous conditions. About sixteen species were finally included. Warm temperature plants would not be expected in so cold a climate, but is to be explained by the insolation. Heath and sand plain plants of warm countries are here restricted to rocks which are warmed by the sun or in some cases by chemical action. Most warm temperature plants live near the tops of the cliffs, where they avoid the frosts of the lowlands. The true heat conditions are shown by the warm-climate types of fruit trees that can be grown there. On the south side the warm temperature plants extend nearly to the bottom of the valley. They cover about 1/2000 part of the Alb Mountain. The comparative altitude of these plants here and in South Bavaria is studied, the lower limit especially being of great interest. The individual stations for our plants in the southwest, central and northeast slopes of the Alb are in the ratio of 87: 9: 1, which is remarkable as the temperature is higher in the northeast. The hypothesis that the presence of the warm temperature plants on the Alb is due to a post-glacial steppe period, is not supported by the conditions on the southwest slope. These plants were there before the glacial period, and by a study of the snow line it is shown that the southwest slope was free from ice at that time, while the northeast slope probably was not. Warm temperature plants now live near the glacier and obviously could have so lived during the glacial period. It is interesting to note that alpine plants are frequently found in the valley, while the warm temperature plants are only on the edge.—*K. M. Wiegand.*

1515. CAMBAGE, R. H. **Notes on the native flora of New South Wales. Part 10. The Federal Capital Territory.** Proc. Linnean Soc., New South Wales 43: 673–711. *Pl. 71–74.* 1918.—An area of about 900 square miles (latitude 35°–36° S.) is discussed. An account of early explorations, geographical (map), climatological, and geological characteristics is given. The absence of trees from the Camberra Plains is pointed out, and soil analyses are given in an attempt to explain this condition. Some peculiar insect attacks of trees were also noted. A general discussion of the flora is given. Certain plants found nearby, but absent from this district, largely as a result of climatic characteristics, are mentioned. A list of plants seen (pages 701–709) is given subject to revision. This includes: Leguminosae, 43 species; Compositae, 42; and Myrtaceae, 34. A total of 361 native species were found, 65 per cent of which are also indigenous to Tasmania.—*Eloise Gerry.*

1516. CHEESEMAN, T. F. **Contributions to a fuller knowledge of the flora of New Zealand: no. 6.** Trans. and Proc. New Zealand Inst. 51: 85–92. 1919.—An annotated list of vascular plants not previously recorded from or of rare occurrence in New Zealand.—*L. W. Riddle.*

1517. EASTWOOD, ALICE. **Early spring at the Grand Cañon near El Tovar [Arizona].** Plant World 22: 65–99. *2 fig.* 1919.—A description of the spring flora of the Grand Cañon is given, with notes on the distribution and appearance of prominent species.—*Charles A. Shull.*

1518. FLYNN, MRS. NELLIE. **A correction.** Rhodora 22: 16. 1920.—In the report of the trip of the Vermont Botanical Club (Rhodora 21: 191. 1919) *Littorella uniflora* was reported as having been collected at "The Gut," South Hero, Vermont. This was an error, the plant in question being *Myriophyllum tenellum,* which occurs occasionally in the state.—*James P. Poole.*

1519. HERRIOTT, MISS E. M. **A history of Hagley Park, Christchurch, with special reference to its botany.** Trans. and Proc. New Zealand Inst. 41: 427–447. 1919.—A comparison of the flora in 1864 with that of the present time.—*L. W. Riddle.*

1520. JACKSON, A. BRUCE. **Bedfordshire [England] Plants.** Jour. Botany 58: 91. 1920. A record of *Carex divisa* var. *chaetophylla* Kükent. in Bedfordshire, England.—*K. M. Wiegand.*

1521. JOHNSTON I. M. **The flora of the pine belt of the San Antonio Mountains of southern California.** Plant World 22: 71–90, 105–122. *2 fig.* 1919.—A description of the San Antonio Mountains and their life zones is given, with lists of plants characterizing each zone. The flora is presented as a catalogue by families, and contains the names of over 300 vascular plants, with notes on the occurrence and distribution.—*Charles A. Shull.*

1522. LONG, BAYARD. **Jasione montana a conspicuous weed near Lakewood, New Jersey.** Rhodora 21: 105–108. 1919.—The writer gives an account of the discovery of about a dozen distinct stations in the neighborhood of Lakewood, New Jersey, where this plant was found growing abundantly in 1917. This species is well known about Newport, Rhode Island, especially on Connecticut Island; but elsewhere it has previously been noted as a very unusual plant. In these newly established stations the characteristic habitats were open, sandy areas generally associated with settlement and cultivation. This plant has previously been known largely as a ballast-ground waif, but in these stations seemed to be a thoroughly established weed, and was reported by one farmer as having been frequent in the region for twenty-five years.—*James P. Poole.*

1523. PALMER, ERNEST J. **Texas Pteridophyta. III.** Amer. Fern Jour. 9: 81–85. 1919. The author continues the enumeration of the Pteridophytes of Texas, listing 18 species distributed among 11 genera with habitat and localities.—*F. C. Anderson.*

1524. Riddelsdell, H. J. **Gloucestershire [England] Notes.** Jour. Botany 57: 350–353. 1919.—The paper consists of critical notes on the distribution of about 30 species in Gloucestershire.—*K. M. Wiegand.*

1525. Thompson, H. S. **Euphrasia hirtella Jord.** Jour. Botany 58: 25. 1920.—Further notes on the occurrence of this species in Britain. This is supplementary to the author's paper in Jour. Botany, Dec., 1919.—*K. M. Wiegand.*

1526. Wallis, Anthony, edited by C. E. Salmon. **Pembrokeshire and Carmarthenshire plants [Wales].** Jour. Botany 57: 345–350. 1919.—An account is given of the life of Wallis. The paper consists mainly of notes on the distribution of a large number of species in various families. Those from the two counties are listed separately.—*K. M. Wiegand.*

1527. Weatherby, C. A. **An omission in the preliminary list of New England Ranunculaceae.** Rhodora 21: 104. 1919.—In the list of New England Ranunculaceae (published in Rhodora 20: 182. 1918) the one New England record for *Cimicifuga racemosa (L.) Nutt., var. dissecta Gray* was omitted. The plant in question was collected by E. H. Eames at Stratford, Connecticut, in 1893.—*James P. Poole.*

1528. Winslow, E. J. **Willoughby Lake, Vt., a candidate for the title of "Richest fern locality."** Amer. Fern Jour. 9: 107–109. 1919.—The Willoughby list, containing 35 species, is compared with the lists of three other localities; 27 species are common to all four localities, and the combined lists contain only 40 species, which is only 6 less than the list for all New England and New York, north of Connecticut.—*F. C. Anderson.*

1529. Woodward, R. W. **Some Connecticut plants.** Rhodora 21: 114–116. 1919.—The writer reports what appears to be *Philotria angustifolia (Muhl.) Britton* growing in brackish water near Old Lyme, Connecticut. He could find no printed record of its previous occurrence in brackish water. *Lophotocarpus spongiosus* is also reported as growing quite abundantly at one station in the same town. It was previously reported as of rare occurrence there. Other plants which the author reports as having collected in various parts of the state are *Panicum virgatum cubense, Elymus riparius, Carex glaucodea, Eriocaulon Parkeri, Actaea rubra neglecta, Aquilegia canadensis flaviflora,* and *Epilobium molle.*—*James P. Poole.*

## FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*
J. V. Hofmann, *Assistant Editor*

1530. Anonymous. **Brazil wood.** Kew Bull. Misc. Inf. [London] 1920: 79–80. 1920.—Notes on *Haematoxylon brasiletto,* the wood of which was formerly an important article of commerce. Notes are given also on *Caesalpinia bahamensis,* the wood of which furnishes a similar dyestuff.—*E. Mead Wilcox.*

1531. Anonymous. **Helgelands Skogselskab. [Report from the Forestry Association at Helgeland, Norway.]** Tidsskr. Skogbruk 28: 129–130. 1920.—The writer relates the interesting fact that Norway spruce, which had been planted out on the wind-swept dunes near the sea, had developed laterally only during the first years, as if to gain protection to the roots. After some years the trees at once began to assume their usual height growth.—*J. A. Larsen.*

1532. Anonymous. **The new flagstaff at Kew.** Kew Bull. Misc. Inf. [London] 1919: 393–399. *Pl. 12–13.* 1919.—The new flagstaff is 214 feet high and made from a 400-year-old tree of *Pseudotsuga douglasii* from Canada.—*E. Mead Wilcox.*

1533. Anonymous. **[Reports from the forest associations in different parts of the country [Norway].** Tidsskr. Skogbruk 28: 126–132. 1920.

1534. Anonymous. **Timber depletion and the answer. A summary of the report on timber depletion and related subjects prepared in response to senate resolution 311.** U. S. Dept. Agric. Dept. Circ. 112. *16 p.* 1920.—Discussion of forest resources of the United States, yesterday and today, and suggestions for a national forest policy which is needed to meet the timber depletion situation.—*L. R. Hesler.*

1535. Bartlett, H. H. **The manufacture of sugar from Arenga saccharifera in Asahan, on the east coast of Sumatra.** Michigan Acad. Sci. Ann. Rept. 21: 155–165. *Pl. 3–6.* 1919.—See Bot. Absts. 6, Entry 1892.

1536. Betts, H. S. **How lumber is graded.** U. S. Dept. Agric. Dept. Circ. 64. *39 p., 9 fig.* 1920.—A discussion and explanation of hardwood and softwood lumber grading, accompanied by descriptions of typical rules.—*L. R. Hesler.*

1537. Carlson, K. A. **The growing of mine props on the High Veld.** Jour. Dept. Agric. Union of South Africa 1: 261–270. 1920.—A low grade quality of timber can be used for mine props, and advantage is taken of this circumstance to plant the most rapidly growing species which supply a timber of sufficient strength. To meet these requirements the principal species used are *Eucalyptus viminalis*, *E. rostrata*, *E. Maidenii*, *E. globulus* and *E. sideroxylon;* sylvicultural notes are given on each of these species. The cost of planting and maintenance is discussed, and it is stated that there are undoubtedly good prospects for afforestation conducted on sound lines.—*E. M. Doidge.*

1538. Clinton, G. P., and Florence A. McCormick. **Infection experiments of Pinus strobus with Cronartium ribicola.** Connecticut (New Haven) Agric. Exp. Sta. Bull. 214: 428–459. *Pl. 37–43.* 1916–1918.—See Bot. Absts. 6, Entry 225.

1539. Crevost, C., and C. Lemarié. **Plantes et produits filamenteux et textiles de l'Indochine. [Fiber- and textile-producing plants of Indo-China.]** Bull. Econ. Indochine 22: 675–709. *19 pl.* 1919. Ibid. 23: 45–71. *4 pl.* 1920.—This is another contribution to this series covering in detail chiefly the bast-fiber producing plants of the Leguminosae, Malvaceae, Tiliaceae, Sterculiaceae, and Linaceae, as well as those fibers especially adapted for the manufacture of cordage, and for the manufacture of paper.—*E. D. Merrill.*

1540. Dixon, Henry H. **Mahogany and the recognition of some of the different kinds by their microscopic characters.** Sci. Proc. Roy. Dublin Soc. 15: 431–486. *22 pl.* 1918.—See Bot. Absts. 6, Entry 385.

1541. Doyle, Joseph. **Observations on the morphology of Larix leptolepsis.** Sci. Proc. Roy. Dublin Soc. 15: 310–327. *2 pl.* 1918.—See Bot. Absts. 6, Entry 386.

1542. Harvey, LeRoy H. **Some phytogeographical observations in Lake County, Michigan.** Michigan Acad. Sci. Ann. Rept. 21: 213–217. 1919.

1543. Haslund, Ove. **Skogvärdierne. [Forest valuation and taxation.]** Tidsskr. Skogbruk 28: 120–123. 1920.

1544. Henry, Augustine, and Margaret G. Flood. **The Douglas firs: a botanical and silvicultural study of the various species of Pseudotsuga.** Proc. Roy. Irish Acad. B, 35: 67–90. *Pl. 12–14.* 1920.—The genus *Pseudotsuga* is divided into seven species and one variety as follows: (1) *P. douglasii* (Carriere) (*taxifolia* Britton), Pacific coast of North Amer.; *P. douglasii* var. *caesia* (Schwerin), northern Rocky Mts.; (2) *P. glauca* (Mayr), Rocky Mts., Colorado and Mexico; (3) *P. macrocarpa* (Mayr), southern California; (4) *P. japonica* (Beissner), Japan; (5) *P. sinensis* (Dode), N. E. Yunnan, China; (6) *P. forrestii* (Craib.), W. Yunnan, China; (7) *P. wilsoniana* (Hayata), Formosa.—Botanical characteristics, range, and size of each spec es are given, followed by detailed discussion of silvical and botanical differences between the Oregon and Colorado species. Measurements of the two species in

British plantations show that while the former "when grown in dense plantations surpasses all other species in yield of timber," the latter "is healthy enough but it is of no commercial value for planting."—Differences in microscopical leaf structure in the various species are indicated with the aid of typical cross section drawings. As final proof of the specific rank of *Pseudotsuga glauca*, results of distillation experiments with leaves of this tree and of *P. taxifolia* from British plantations are given. Oil from the Oregon species contains appreciable amounts of the fragrant *geraniol*, chief constituent of Indian palmarosa oil and present in citronella oil, otto of roses, lemon oil, etc., hitherto reported as a constituent of the oil of some species of *Callitris*, or "Cypress Pines" of Australia, but not from other conifers. This oil, which is said to give the peculiarly pleasant odor to the leaves of Oregon Douglas fir, is not found in the Colorado variety. Oil of the latter species contains a large percentage of *pinene*, which constituent is not found in the Oregon species. An interesting analogy is pointed out in the distribution, size of cones, and difference in oil content of the varieties of Douglas fir and Western Yellow Pine.—*Woodbridge Metcalf.*

1545. JUDD, C. S. **The Australian red cedar.** Hawaiian Forester and Agric. **17**: 57–59. *1 pl.* 1920.—An account of the successful introduction of *Cedrela Australis* in Hawaii, with a general description of its appearance, silvical characters, and economic uses. Because of its ease of propagation, rapid growth, and valuable wood products, it gives great promise as one of the future timber-producing trees of the territory. The plate shows an Australian red cedar, measuring 30 feet in height, 4½ inches d.b.h., two years and nine months from planting.—*Stanley Coulter.*

1546. JUDD, C. S. **Division of Forestry.** Hawaiian Forester and Agric. **16**: 6–9. 1919.—In addition to the routine report for December, 1918, the establishment and location of six new forest reserves, aggregating 41,355 acres is given. This gives a present total area of forest reserves in the Territory of 814,926 acres, of which 554,842 acres is government land.—*Stanley Coulter.*

1547. JUDD, C. S. **Eucalyptus plantation.** Hawaiian Forester and Agric. **16**: 20–24. 1919.—"The object of the plantation was to secure data as to the habit, form, rate of growth, and relative value under local conditions of species of Eucalyptus supposed to be of economic importance that are as yet but little known in Hawaii." The conditions were not favorable for best growth and development and the test was an endurance rather than a growth test. Eighteen species were planted, measurements being made at five years growth, both of diameter and height. Of the species used, the Black butt (*E. pilularis*) made the best showing, producing an equivalent of 4½ cords per acre in five years. Other species making a fair showing were *E. gomphocephala*, *E. muelleriana*, and *E. Sieberiana*, which produced an equivalent yield of 3.42 to 3.62 cords per acre for five years. Measurements are to be continued at five year intervals.—*Stanley Coulter.*

1548. JUDD, C. S. **Forestry in Hawaii.** Hawaiian Forester and Agric. **16**: 271–299. 1919.—A series of 3 lectures delivered at the short course for plantation men at the College of Hawaii, Honolulu. The subjects treated are "The Beneficial Effects of Forests," "The Native Hawaiian Forests," and "Methods of Forest Protection." Admirably adapted to Hawaiian needs.—*Stanley Coulter.*

1549. JUDD, C. S. **The koa tree.** Hawaiian Forester and Agric. **17**: 30–35. *Pl. 3.* 1920.—The genus *Acacia*, to which the Koa belongs, is represented in the Hawaiian Islands by three species, one of which, *A. Koa*, has two varieties. *Acacia Koa* is the familiar form and is found on all of the islands. The other species and varieties are less common and of more or less restricted distribution. General descriptions of the forms are given and the possible origin and economic uses are discussed. At one time the Hawaiians used Koa wood for canoes, surf boards, paddles, and spears, as well as for house timber. Very few Koa canoes are now made since the large trees suitable for their construction have almost entirely disappeared. The chief present value of the Koa tree is not as a lumber producer, but as a tree for a cover forest on mountain slopes. It is also a suitable tree for reforesting denuded areas where good drainage and favorable soil conditions obtain.—*Stanley Coulter.*

1550. JUDD, C. S. **The kukui or candlenut tree.** Hawaiian Forester and Agric. 16: 222–223. *Pl. 1.* 1919.—This Euphorbiaceous tree (Aleurites moluccana (L) Willd.) was probably introduced into Hawaii by the natives many years ago from Kahiki. They depended for their illumination upon its oily nuts, and from the juice of the fleshy covering of the green fruit secured the black dye with which they tatooed their skins. The Kukui is the distinguishing tree in the forest type which is found from approximately 1000 to 2000 feet above sea level. The tree is singularly free from serious insect pests and plant diseases although the white, light, soft wood rots very readily and is not at all durable in contact with the soil.—*Stanley Coulter.*

1551. JUDD, C. S. **Lands in forest reserves, Territory of Hawaii, April 1, 1919.** Hawaiian Forester and Agric. 16: 89–100. 1919.—The significance of forestry in the Territory of Hawaii can be best appreciated by a summary of the acreage of lands in forest reserves in the different islands. Kauai has 148,213 acres; Oahu, 67,933; Molokaie, 44,674; Mani, 121,128; and Hawaii, 436,791—a total of 818,739 acres.—*Stanley Coulter.*

1552. JUDD, C. S. **The Makiki nursery.** Hawaiian Forester and Agric. 17: 124–126. 1920.—An interesting and compact sketch is given of the plan and output of this nursery located in Makiki Valley, Honolulu. The annual average distribution of tree seedlings for the past seven years has exceeded 350,000. Attention is also given to ornamental shrubs and vines.—*Stanley Coulter.*

1553. JUDD, C. S. **Original algaroba tree gone.** Hawaiian Forester and Agric. 16: 308–310. *2 pl.* 1919.—Notes the destruction, due to city improvement, on October 23, 1919, of the algaroba tree planted by Father Bachelot in December, 1828, in the Catholic mission grounds. "Perhaps no other tree in the world has had such a remarkable history or has been responsible for greater benefits than this original algaroba, from which there have been established on the shores throughout these islands forests which cover approximately 90,000 acres, now producing an annual crop of about 30,000 cores of excellent fuel, over $100,000 worth of honey, and an enormous yield of beans which furnish a valuable fattening food for stock at a time when the long, dry summer has exhausted the grass supply.—*Stanley Coulter.*

1554. JUDD, C. S. **A volume table for algaroba.** Hawaiian Forester and Agric. 16: 64–66. 1919.—The algaroba (*Prosopis juliflora* D. C.) introduced into Hawaii in 1828 has since spread over approximately 80,000 acres of what was formerly waste or poor grazing land. The wood is used largely for fuel and has therefore a high economic value. The table, which is to be regarded as merely preliminary, is based on the measurement of 19 trees in the Punahou district. Whether it will apply to the scattered algaroba tracts on the Island is yet to be determined.—*Stanley Coulter.*

1555. JUDD, C. S. **The wiliwili tree.** Hawaiian Forester and Agric. 17: 95–97. *2 pl.* 1920.—The wiliwili belongs to the genus *Erythrina* and is represented in the Hawaiian Islands by the single species *E. monosperma.* It occurs in clumps or as individuals up to 1500 feet elevation in the hottest and driest districts on the leeside of all of the islands. The tree is probably best known because of its wood, which is the lightest of any of the Island trees. It is also characterized by its wealth of crimson blossoms, which make it worthy of cultivation as an ornamental.—*Stanley Coulter.*

1556. KAURIN, W. **Skogplantningen i Frankrike.** [**Forest planting in France.**] Tidskr. Skogbruk 28: 97–108. *9 pl.* 1920.—Plantings made in the French war zone by the Norwegian government.—*J. A. Larsen.*

1557. KORSTIAN, CLARENCE F. **Native vegetation as a criterion of site.** Plant World 22: 253–261. 1919.—The author presents a general discussion of methods of site determination, and suggests that no one criterion should be adopted to the exclusion of other criteria. He urges that more consideration should be given to the indicator significance of native shrubby and herbaceous vegetation in classifying forest lands, and in selecting suitable sites for reforestation work.—*Charles A. Shull.*

1558. Kotze, J. J. **Wood-charcoal and its manufacture.** South African Jour. Indust. 3: 423–437. 1920.

1559. Lovejoy, P. S. **Farms vs. forests.** Michigan Acad. Sci. Ann. Rept. 21: 201–212. 1919.—The writer gives in a general way the condition of the 228,509,000 acres of logged-off land in the United States to-day. It has been the custom, especially in Michigan and other lake states, to attempt to replace all cut-over forest lands with farms. The unscrupulousness of the professional coloniser and the inability of the home seeker to foresee conditions has caused 4,000,000 acres of land, or 100,000 farms, to be abandoned. The writer suggests that an analysis be made of each cut-over region in order to determine whether the area should be used for general farming, grazing, fruit growing, or reforesting. The real farm and the real forest need not overlap. The writer further emphasizes the general forest conditions of to-day and the urgent need for the reforesting of the logged-off, idle lands.—*H. C. Young.*

1560. Rock, Joseph F. **One government forest.** Hawaiian Forester and Agric. 16: 39–40. *Pl. 3.* 1919.

1561. Werner, J. **Stipendieberetning.** [**Report from a travelling fellowship.**] Tidsskr. Skogbruk 28: 108–117. 1920.—Observations on plantations and forest conditions near Bergen and Stavanger on the west coast of Norway.—*J. A. Larsen.*

1562. Young, L. J. **A study in the difference in soil requirements of pine and spruce.** Michigan Acad. Sci. Ann. Rept. 21: 219–221. 1919.—This article points out the importance in forest plantings of a proper consideration of site condition and species to be planted. In the Saginaw Forest there is an area where spruce has been making a poor growth for 15 years. The surface soil has been badly washed and is also very poor in the necessary elements. This is taken as the reason for the unusually poor tree growth. Pine is said to demand less from a soil in order to make the same growth; so pine was planted some 4 years ago among the spruce. Since pine trees grow relatively slowly during the first 5 years, there has not been sufficient time in this experiment to show how well they can do; but the Scotch pine averages a foot taller in 4 years than the spruce in 15 years. The Scotch pine is more adaptable, therefore, for this site and should have been planted originally. Other species of pine were planted also. More complete results will be forthcoming in 4 or 5 years; more definite conclusions can be drawn from these.—*R. P. Hibbard.*

## GENETICS

G. H. Shull, *Editor*

J. P. Kelly, *Assistant Editor*

1563. Abidin, J. **Pferdezucht und Pferderassen im osmanischen Reich.** [**Horse breeding and the breeds of horses in the Turkish Empire.**] Flugschr. Deutsch. Ges. f. Züchtungskunde 42: 1–31. *47 fig.* 1918.—This paper goes briefly into the history of military horse breeding in Turkey and describes the breeds of horses found in the Old Turkish Empire. The sub-breeds of the Arab horse, the customs connected with horse breeding, and the beliefs held by the Arabs in regard to heredity are discussed in most detail.—*Sewall Wright.*

1564. Adamson, R. W. **The Bartram oak.** Sci. Amer. 122: 301. 1920.—Confirmatory comment on Arthur Hollick's article, "The story of the Bartram Oak," Sci. Amer. 121: 422. 1919. "From time immemorial" common comment in the South, where these heterophyllous oaks are abundant, is that they are willow oak × red oak hybrids. Natural progeny of southern heterophyllous oak shows large numbers of classes based on leaf form. [See Bot. Absts. 4, Entry 615.]—*J. Ben Hill.*

1565. Åkerman, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116–127. *6 fig.* 1920.—Two spikes were chimaeras, conditioned by a speltoid heterozygote and its corresponding normal type, of which the latter formed the greater part of the spikes, while the

speltoid only formed the epidermis of one side of the spikes. Consequently all the seeds gave typical plants only. In a third chimaera-spike the speltoid component seems to have given rise only to part of the epidermis in the lower part of the spike, while in the development of the upper part the typical epidermis has been entirely replaced by the speltoid. A fourth spike had the outer glumes on the four lowest spikelets on each side of the rachis quite typical and distended on the one side of the spikelets, while on the other side they were speltoid. In the upper part of the spike all the outer glumes were of the speltoid type. From the seeds situated nearest the typical outer glumes in the 8 lowest spikelets 5 typical plants were obtained in all. The others gave speltoids and the normal type. The progeny of the normals were all normals. The plants originating from the speltoids showed segregation into speltoid heterozygotes identical with the parent plants, and plants of the normal type in the ratio 1:1 (Cf. Nilsson-Ehle, Bot. Not. 1917). The plant in question may be a real chimaera largely made up of a speltoid heterozygote together with two sectors of the normal type of at least two cell layers in thickness.—*K. V. Ossian Dahlgren.*

1566. Amend, F. **Untersuchungen über flämischen Roggen unter besonderer Berücksichtung des veredelten flämischen Landsroggen und seiner Züchtung. [Investigations on Flemish rye with special reference to improved varieties and their breeding.]** Landw. Jahrbüch. 52:-614-669. 1919.—Original Flemish "land-rye" (Landroggen) subjected to breeding since 1903 in maritime climate of western Flanders. From 1903 to 1909 mass selection of heads was practised, but beginning in 1909 plant selection. Work interrupted by war. The fine qualities of the "land-rye" resulted. Certain correlations are pointed out. Uniform head of medium thickness and green grains are given by author as desirable qualities to breed for. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 112. Dec. 1919.]—*J. P. Kelly.*

1567. Anonymous. **Ten week stock and doubling.** Florists Exch. 50: 159. July 24, 1920.—There is little foundation for the assumption that Germans have a secret enabling them to produce strains of stocks yielding 80 per cent or over of doubles. Because of scarcity of seed due to the war, English and French growers started raising their own seed. French had already proved they could produce strains yielding a high percentage of doubles. Experiments carried on by staff of Royal Horticultural Society showed that higher percentage of doubles was produced by more vigorous plants, but this met disapproval. In Scotland the strain Midlothian yielded more doubles with age. However, it was found that a strain bred for doubleness will through its singles continue to produce doubles in the same proportion. French pot-saved seed and English open-ground seed were planted in the open, the French strain producing a much higher percentage and superior quality of doubles. Single-flowered plants of the white-flowered double-growing French strain varied but slightly as to flower characters, but markedly in seed-pod characters. Some plants had long, thin, easy-thrashing pods, others short, thick, hard-thrashing pods. Thin pods are believed to give rise to mostly singles; thick ones to mostly doubles. Five hundred progeny from an extra long, thin-podded plant gave only 2 doubles, while progeny from short-podded plants gave as high proportion of doubles as best pot-saved seeds.—*Francena R. Meyer.*

1568. Anonymous. **Biometric and eugenic laboratories at University College, London.** Science 52: 30-31. July 9, 1920.—At this institution there has been added to the Drapers' Company Biometric Laboratory and the Galton Laboratory for National Eugenics, a third building provided by Sir Herbert Bartlett. This last is superbly equipped with museums, lecture theater, laboratory rooms, and apparatus.—*Merle C. Coulter.*

1569. Anonymous. [Rev. of Anthony, Stephen, and Harry V. Harlan. **Germination of barley pollen.** Jour. Agric. Res. 18: 525-536. *2 pl., 2 fig.* Feb. 16, 1920.—[See Bot. Absts. 5, Entries 949 and 1449.] Gard. Chron. 68: 103. Aug. 28, 1920.

1570. Anonymous. [German rev. of Backhouse, W. O. **The inheritance of glume length in Triticum polonicum. A case of zygotic inhibition.** Jour. Genetics 7: 125-133. Feb., 1918. (See Bot. Absts. 1, Entry 211; 3, Entry 2157.)] Zeitschr. Pflanzenzücht. 7: 206. June, 1920.

1571. ANONYMOUS. [German rev. of: BARTLETT, H. H. **The status of the mutation theory with especial reference to Oenothera.** Amer. Nat. 1916: 513–529. 1916.] Zeitschr. Pflanzenzücht. 7: 207–209. June, 1920.

1572. ANONYMOUS. [German rev. of BECKER. **Serologische Untersuchungen auf dem Gebiete von Pflanzenbau und Pflanzenzucht. (Serological investigations in the rea'ms of horticulture and plant breeding.)** Landwirtsch. Jahrb. 53: 245–276. 1919.] Zeitschr. Pflanzenzücht. 7: 209. June, 1920.

1573. ANONYMOUS. [German rev. of: BEIJERINCK, M. W. **De enzymtheorie der erfelijkheid. (The enzyme theory of heredity.)** Kon. Akad. Wetensch. Amsterdam 25: 1231. 1917. See Bot. Absts. 1, Entry 1166. 3, Entry 433.)] Zeitschr. Pflanzenzücht. 6: 186. Dec., 1918.

1574. ANONYMOUS. [German rev. of: BROTHERTON, WILBER, JR., AND H. H. BARTLETT. **Cell measurement as an aid in the analysis of quantitative variation.** Amer. Jour. Bot. 5: 192–206. *2 fig.* April, 1918. (See Bot. Absts. 1, Entry 865.)] Zeitschr. Pflanzenzücht. 7: 209. June, 1920.

1575. ANONYMOUS. [German rev. of: COHEN-STUART, C. P. **A basis for tea selection.** Bull. Jarb. Bot. Buitenzorg. III, 1: 193–320. 1919. (See Bot. Absts. 5, Entry 1469.)] Zeitschr. Pflanzenzücht. 7: 209. June, 1920.

1576. ANONYMOUS. [German rev. of: CORRENS, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisse. (Continuation of the attempt to experimentally shift the sex ratio.)** Sitz.-Ber. Preuss. Akad. Wiss. Berlin 1918: 1175–1200. *3 fig.* 1918.] (See Bot. Absts. 5, Entry 1636.) Zeitschr. Pflanzenzücht. 7: 209. June, 1920.

1577. ANONYMOUS. [German rev. of: CORRENS, C. **Zur Kenntnis einfacher mendelnder Bastarde. I. Die Unterscheidung der pilulifera-Homozygoten und der Heterozygoten des Bastardes Urtica pilulifera Dodartii. II. Mirabilis jalapa xantha und ihre Bastarde. III. Urtica urens peraurea. (Contributions to knowledge of simple Mendelian hybrids. I. The distinguishing of pilulifera-homozygotes and the heterozygotes of the hybrid Urtica pilulifera Dodartii. II. Mirabilis jalapa peraurea.)** Sitzungsber. k. Preuss Akad. Wiss. 1918: 221–268. 1918. (See Bot. Absts. 1, Entry 1184.)] Zeitschr. Pflanzenzücht. 6: 186. Dec., 1918.

1578. ANONYMOUS. [German rev. of: CORRENS, C. **Vererbungsversuche mit buntblättrigen Sippen. I. Capsella bursa-pastoris albovariabilis und chlorina. (Genetical studies with variegated races. I. Capsella bursa-pastoris albovariabilis and chlorina.)** Sitzungsber. K. Akad. Wiss. Wien 34: 585–610. 1919. (See Bot. Absts. 4, Entry 551.)] Zeitschr. Pflanzenzücht. 7: 210. June, 1920.

1579. ANONYMOUS. [German rev. of: DRUDE, C. **Erfahrungen bei Kreuzungsversuchen mit Cucurbita Pepo. (Experiences in crossing experiments with Cucurbita Pepo.)** Ber. Deutsch. Bot. Ges. 35: 25–57. *1 pl.* 1918.] Zeitschr. Pflanzenzücht. 6:–187–188. Dec., 1918.

1580. ANONYMOUS. [German rev. of: EDLER, W. **Die Verzweigung der Ackerbohne. (Branching of field beans.)** Fühlings Landwirtsch. Zeit. 1919: 441 450. 1919.] Zeitschr. Pflanzenzücht. 7: 210. June, 1920.

1581. ANONYMOUS. [German rev. of: EMERSON, R. A. **Genetical studies of variegated pericarp in maize.** Genetics 2: 1–35. 1917.] Zeitschr. Pflanzenzücht. 7: 210–212. June, 1920.

1582. ANONYMOUS. [German rev. of: EVEREST, A. **Recent chemical investigations of the anthocyan pigments and their bearing upon the production of these pigments in plants.** Jour. Genetics 4: 361–367. 1915.] Zeitschr. Pflanzenzücht. 6: 188–189. Dec., 1918.

1583. ANONYMOUS. [German rev. of: FRUWIRTH, C. **Selection in pure lines.** Jour. Heredity 8: 90–94. *1 fig.* 1907.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1584. ANONYMOUS. [German rev. of: FRUWIRTH, C. **Die Saatenanerkennung. (Seed recognition.)** *131 p., 66 fig.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 198. Dec., 1918.

1585. ANONYMOUS. [German rev. of: FRUWIRTH, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtungen. II. Die Züchtung von Mais, Futterrüben und anderen Rüben, Oelpflanzen und Gräsern. (Handbook of agricultural plant breeding. II. The breeding of maize, fodder beets and other roots, oil plants and grasses.)** *3rd ed., 262 p., 50 fig.* P. Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 198–199. Dec., 1918.

1586. ANONYMOUS. [German rev. of: FRUWIRTH, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel, Erdbirne, Lein, Hanf, Tabak, Hopfen, Buchweizen, Hülsenfrüchtern und kleeartigen Futterpflanzen. (Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops, buckwheat, legumes and clover-like forage plants.)** *3rd ed., 240 p., 35 fig.* P. Parey: Berlin, 1919.] Zeitschr. Pflanzenzücht. 7: 222–223. June, 1920.

1587. ANONYMOUS. [German rev. of: HANSEN, W. **Gedanken über Organisation und Arbeitsersparnis in der Pflanzenzucht. (Thoughts on organization and labor-saving in plant breeding.)** Deutsch. Landw. Presse 1918: 261–262. 1918.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1588. ANONYMOUS. [German rev. of: HARRIS, L. **The application of correlation formulae to the problem of varietal differences in disease resistance: data from the Vermont experiments with potatoes.** Amer. Nat. 51: 238–244. 1917.] Zeitschr. Pflanzenzücht. 6: 189. Dec., 1918.

1589. ANONYMOUS. [German rev. of: HROMÁDKO, J. **Die Variabilität der Nachkommenschaft derselben Futterrübenmutter in der 1. Generation. (The variability of progenies of the same mother beet in the first generation.)** Zeitschr. Zuckerindus. Böhmen 42: 581–601. 1918.] Zeitschr. Pflanzenzücht. 6: 189–190. Dec., 1918.

1590. ANONYMOUS. [German rev. of: JOHANNSEN, W. **Ärftlicheten i historisk och experimentell belysning. (Heredity in historical and experimental light.)** *viii + 327 p., 52 fig.* 1918.] Zeitschr. Pflanzenzücht. 6: 199. Dec., 1918.

1591. ANONYMOUS. [German rev. of: KALT, B. **Der Begriff "Originalsaatgut" und seine Anwendung bei der Züchtungsanerkennung. (The concept "Original seed" and its application in the recognition of breeding.)** Fühlings Landwirtsch. Zeit. 1919: 460–471. 1919.] Zeitschr. Pflanzenzücht. 7: 213. June, 1920.

1592. ANONYMOUS. [German rev. of: KIESSLING, L. **Über eine Mutation in einer reinen Linie von Hordeum distichum L. (On a mutation in a pure line of Hordeum distichum L.)** Zeitschr. indukt. Abstamm. Vererb. 19: 145–159. June, 1918.] Zeitschr. Pflanzenzücht. 6: 190. Dec., 1918.

1593. ANONYMOUS. [German rev. of: KIESSLING, L. **Einige besondere Fälle von chlorophylldefekten Gersten. (Several special cases of barley, defective in chlorophyll.)** Zeitschr. indukt. Abstamm. Vererb. 19: 160–176. June, 1918. (See Bot. Absts. 3, Entry 263.)] Zeitschr. Pflanzenzücht. 6: 190. Dec., 1920.

1594. ANONYMOUS. [German rev. of: KIESSLING, L. **11. Bericht der Bayrischen Landessaatzuchtanstalt in Weihenstephan (1914–1918). (11th report of the Bavarian Seed-breeding Institution in Weihenstephan (1914–1918) ).** Landw. Jahrb. f. Bayern 1919: 1–178. 1919.] Zeitschr. Pflanzenzücht. 7: 213–214. June, 1920.

1595. Anonymous. [German rev. of: Love, H. H., and W. T. Craig. **Small grain investigations.** Jour. Heredity 9: 67–76. Feb., 1918. (See Bot. Absts. 1, Entry 37.)] Zeitschr. Pflanzenzücht. 7: 215. June, 1920.

1596. Anonymous. [German rev. of: Love, H. H., and W. T. Craig. **The synthetic production of wild wheat forms.** Jour. Heredity 10: 51–64. *1 pl., 9 fig.* Feb., 1919. (See Bot. Absts. 3, Entry 1012.)] Zeitschr. Pflanzenzücht. 7: 215–216. June, 1920.

1597. Anonymous. [German rev. of: Love, H. H., and W. T. Craig. **Fertile wheat-rye hybrids.** Jour. Heredity 10: 195–207. *11 fig.* May, 1919.] Zeitschr. Pflanzenzücht. 7: 216. June, 1920.

1598. Anonymous. [German rev. of: Love, H. H., and A. C. Fraser. **The inheritance of the weak awn in certain Avena crosses.** Amer. Nat. 51: 481–493. *2 fig.* 1917. (See Bot. Absts. 1, Entry 1263.)] Zeitschr. Pflanzenzücht. 6: 191. Dec., 1918.

1599. Anonymous. [German rev. of: Lundberg, Fr., and Å. Åkermann. **Jakttagelser rörande fröfärgen hos avkommen aven spontan korsning mellan tvenne former av Phaseolus vulgaris. (Observations on the seed color of the progeny of a spontaneous hybridization between two varieties of Phaseolus vulgaris.)** Sver. Utsädesför. Tidskr. 27: 115–121. 1917.] Zeitschr. Pflanzenzücht. 6: 191–192. Dec., 1918.

1600. Anonymous. [German rev. of: Miles, Frank C. **A genetic and cytological study of certain types of albinism in maize.** Jour. Genetics 4: 193–214. 1915. (See Bot. Absts. 1, Entry 918.)] Zeitschr. Pflanzenzücht. 6: 192. Dec., 1918.

1601. Anonymous. [German rev. of: Molz. **Über die Züchtung widerstandsfähiger Rebsorten. (On the breeding of resistant varieties of grapes.)** Jahrb. Deutsch. Landw. Ges. 33: 156–204. 1918.] Zeitschr. Pflanzenzücht. 6: 192. Dec., 1918.

1602. Anonymous. [German rev. of: Newman, L. **Die Weizenerzeugung in Kanada. (Wheat production in Canada.)** Internat. Agarisch. Rundschau 8: 595–601. 1917.] Zeitschr. Pflanzenzücht. 6: 192–193. Dec., 1918.

1603. Anonymous. [German rev. of: Punnett, R. C. **Reduplication series in sweet peas. II.** Jour. Genetics 6: 185–193. 1917. (See Bot. Absts. 2, Entry 1232.)] Zeitschr. Pflanzenzücht. 6: 193–194. Dec., 1918.

1604. Anonymous. [German rev. of: Rasmuson, H. **Zur Frage von der Entstehungsweise der roten Zuckerrüben. (On the origin of red sugar beets.)** Bot. Notiser 1919: 169–180. *2 fig.* 1919. (See Bot. Absts. 3, Entry 2182.)] Zeitschr. Pflanzenzücht. 7: 217–218. June, 1920.

1605. Anonymous. [German rev. of: Raum, S. **Beiträge zur Praxis der Grassamenerzeugung und des Grassamenbaues. (Contribution to the practice of grass-seed production and grass-seed culture.** Illus. Landwirtsch. Zeit. 1920: 25–26. 1920. (See Bot. Absts. 6, Entry 1741.)] Zeitschr. Pflanzenzücht. 7: 217. June, 1920.

1606. Anonymous. [German rev. of: Raum, S. **Zur Kenntnis des italienischen Raygrases unter besonderer Berücksichtigung seiner Züchtung. (Italian ray grass with special reference to its breeding.)** Fühlings Landw. 1920: 28–37. 1920. (See Bot. Absts. 6, Entry 1741.)] Zeitschr. Pflanzenzücht. 7: 217. June, 1920.

1607. Anonymous. [German rev. of: Reuss. **37-jährige Fichtenreinzuchtversuche in Österreich. (37-year experiment in pure breeding of pine trees in Austria.)** Centralbl. Gesammte Fortsw. 1916: 383–417. 1916.] Zeitschr. Pflanzenzücht. 6: 194. Dec., 1918.

1608. Anonymous. [German rev. of: Richardson, C. W. **A further note on the genetics of Fragaria.** Jour. Genetics 7: 167-170. May, 1918. (See Bot. Absts. 1, Entry 494.)] Zeitschr. Pflanzenzücht. 7: 218. June, 1920.

1609. Anonymous. [German rev. of: Roberts, Herbert F. **Yellow-berry in hard winter wheat.** Jour. Agric. Res. 18: 155-169. *2 fig.* Nov. 1, 1919.] Zeitschr. Pflanzenzücht. 7: 218-219. June, 1920.

1610. Anonymous. [German rev. of: Schellenberg, H. **Die Vererbungsverhältnisse von Rassen mit gestreiften Blüten und Früchten. (The inheritance ratios of races with striped flowers and fruits.)** Vierteljahrschr. Naturwissensch. Ges. Zürich 61: 1916.] Zeitschr. Pflanzenzücht. 6: 195. Dec., 1918.

1611. Anonymous. [German rev. of: Tornau. **Einige Mitteilungen über variabilitätsverhältnisse in einem konstanten Weizenstamm. (Some communications concerning variability relations in a constant wheat strain.)** Jour. Landw. 67: 111-149. 1919.] Zeitschr. Pflanzenzücht. 7: 219. June, 1920. [See Bot. Absts. 5, Entry 1677.]

1612. Anonymous. [German rev. of: Urban, J. **Über die Grösse der Stecklinge. (On the size of cuttings.)** Zeitschr. Zuckerindust. Böhmen 42: 521-526. 1918.] Zeitschr. Pflanzenzücht. 6: 195-196. Dec., 1918.

1613. Anonymous. [German rev. of: van der Wolk, P. **Onderzoekingen betreffende den Cocospalm. (Investigations concerning the cocoanut palm.)** Cultura 1918: 1-34. 1918.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1614. Anonymous. [German rev. of: von Rümker, K. **Die Züchtung der Ölpflanzen. (The breeding of oil plants.)** Jahrb. Deutsch. Landw. Ges. 33: 150-158. 1918.] Zeitschr. Pflanzenzücht. 6: 194. Dec., 1918.

1615. Anonymous. [German rev. of: von Rümker, K. **Die staatliche Organisation der Sortenprüfung. (State organization of variety testing.)** *32 p.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 200. Dec., 1918.

1616. Anonymous. [German rev. of: von Rümker, K. **42 Sortenanbauversuche im Verwaltungsgebiete des Oberfehlshabers Ost. (Forty-two variety culture tests in Oberfehlshabers Ost.)** *72 p.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 6: 201-203. Dec., 1918.

1617. Anonymous. [German rev. of: von Ubisch, G. **Kritische Beträchtungen zur Hypothese der primären und sekundären Koppelung. (Critical consideration of the hypothesis of primary and secondary coupling.)** Zeitschr. indukt. Abstamm. Vererb. 19: 193-201. *3 fig.* June, 1918. (See Bot. Absts. 3, Entry 298.)] Zeitschr. Pflanzenzücht. 6: 195. Dec., 1918.

1618. Anonymous. [German rev. of: Wagner, M. **Abbauerscheinungen am Hopfen und Organisation in der Hopfenzüchtung. (Phenomena in unimproved hops and organization in hop-breeding.)** Deutsch. Landw. Presse 1919: 788. 1919.] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1619. Anonymous. [German rev. of: Wheldale, M. **Our present knowledge of the chemistry of the Mendelian factors influencing flower colour.** Jour. Genetics 2: 369-376. 1915.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1620. Anonymous. [German rev. of: White, O. E. **Inheritance of endosperm color in maize.** Amer. Jour. Bot. 4: 396-406. 1917. (See Bot. Absts. 1, Entry 1313.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1621. Anonymous. [German rev. of: White, O. E. **Breeding new castor beans.** Jour. Heredity 9: 195–200. May–June, 1918. (See Bot. Absts. 1, Entry 249.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1622. Anonymous. [German rev. of: White, Orland E. **Inheritance studies in Pisum. III. The inheritance of height in peas.** Mem. Torrey Bot. Club. 17: 316–322. June 10, 1918. (See Bot. Absts. 1, Entry 250.)] Zeitschr. Pflanzenzücht. 7: 220. June, 1920.

1623. Anonymous. [German rev. of: White, O. E. **Inheritance studies on castor beans.** Brooklyn Bot. Gard. Mem. 1: 513–521. *6 pl.* July, 1918. (See Bot. Absts. 1, Entry 952.)] Zeitschr. Pflanzenzücht. 7: 221–222. June. 1920.

1624. Anonymous. [German rev. of: Wohanka and Company. **28. Jahresbericht der Rübensamenzüchtungen von Wohanka & Comp. (28th annual report of the beet breeding of Wohanka & Co.)** *95 p., 5 fig.* Wohanka & Co.: Prag, 1918.] Zeitschr. Pflanzenzücht. 6: 196. Dec., 1918.

1625. Anonymous. [German rev. of: Zade. **Die Versuche über Klee- und Gräserzüchtungen des landwirtschaftlichen Institutes Jena. (Experiments in clover and grass breeding of the Jena Agricultural Institute.)** Jahrb. Deutsch. Landwirtsch. Ges. 1918: 139–150. 1918.] Zeitschr. Pflanzenzücht. 6: 197. Dec., 1918.

1626. Anonymous. [German rev. of: Zinn, J., and F. M. Surface. **Studies on oat breeding. V. The $F_1$ and $F_2$ generations of a cross between a naked and hulled oat.** Jour. Agric. Res. 10: 293–312. 1917.] Zeitschr. Pflanzenzücht. 6: 197. Dec., 1918.

1627. Aumiot, J. **Rajeunissement et perfectionnement de la pomme de terre. [The rejuvenation and improvement of potatoes.]** Compt. Rend. Acad. Agric. France 5: 905–910. 1919.—Several thousand potato seedlings were grown from crosses between cultivated varieties and also hybrids with *Solanum commersonii* and *S. maglia*. The plants were vigorous and flowered abundantly. The progenies varied in yield, and a table is appended giving the number and weights of the tubers. The experiments comprised 24 crosses between ten cultivated varieties and a hybrid between *S. maglia* × *S. tuberosum* var. Enowflack. The vigor and productivity were infinitely superior to the open-pollinated parents. The form and color of the skin and flesh were modified also. Many crosses with "Bolivienne 10bis" were free from rot and were resistant to *Phytophtora infestans*. The cross between *S. maglia* and *S. tuberosum* var. Enowflack was intermediate between the parents though tending to resemble more closely *S. tuberosum*.—A mutation from *S. maglia* to *S. tuberosum* is recorded. This mutant resembled the common cultivated potato in the characters of both plant and tubers. Three mutants were found in *S. commersonii* which resembled each other in tuber characteristics. It is stated that many mutants are suitable for cultivation, but one found in *S. maglia* has proved to be very susceptible to *Phytophtora infestans*. He concludes that although the uncultivated species of potatoes apparently are unpromising from the standpoint of obtaining varieties suitable for commercial cultivation, nevertheless entirely satisfactory mutants are found, and he believes that the potato can be improved rapidly through crossing.—*J. H. Kempton.*

1628. Bach, Siegfried. **Zweierlei Weisslinge bei Mais. [Two kinds of albinos in maize.]** Zeitschr. Pflanzenzücht. 7: 238–241. June, 1920.

1629. Baudouin, M. **Découverte d'un procédé sûr pour reconnaitre le sexe des axis humains à tout âge. [Discovery of a process for the certain recognition of sex in the human axis at all ages.]** Compt. Rend. Acad. Sci. Paris 167: 652–653. 1918.—The diameters of the foramen of the vertebral human axis from both sexes of various ages were measured. It was found that the difference between the anterior-posterior diameters and the transverse diameters of the foramina was very marked in the males while in the females it was always very slight.—*D. D. Whitney.*

1630. BAUER, J. **Aufgaben und Methoden der Konstitutionsforschung. [Problems and methods of study of the constitution.]** Wiener klin. Wochenschr. 32: 273–276. 1919.—Research on variations in the constitution has as its ultimate aim an explanation of inter- and intra-racial differences in anatomical and functional conditions, with special reference to the influence of these conditions on the incidence and course of disease. The various types of habitus that have been proposed are of great importance, but need careful analysis and revision. A thorough study of the nature of factors determining a given habitus is especially needed. In the study of organs and organ systems care must be exercised in determining whether any particular characteristic owes its existence to a peculiarity inherent in the organ itself, is "autochthonous," or to influences brought about through intermediation of the neuro-glandular system. With reference to the incidence of disease we must determine to what extent constitutional predispositions are taxable for the incidence of different diseases, and whether or not there are some diseases whose occurrence is wholly dependent on more or less specific constitutional deficiency. It is also highly important to be able to recognize anatomical or functional constitutional weakness before it has already been exposed by disease. The author makes a plea for a clinico-hereditary study of every possible case, since only in that way may be obtained knowledge of the greatest value to practical medicine, public health, and eugenics.—*C. H. Danforth.*

1631. B(EAN), W. J. **One-leaved ash (Fraxinus excelsior heterophylla.)** Kew Bull. Misc. Inf. [London] 1919: 390–391. 1919.—Seeds from this form gave part of the seedlings of the same type.—*E. Mead Wilcox.*

1632. BECKER, J. **Serologische Untersuchungen auf dem Gebiete von Pflanzenbau und Pflanzenzucht. [Serological investigations in the realms of plant production and plant breeding.]** Landwirtsch. Jahrb. 53: 245–276. 1919.—See Bot. Absts. 6, Entry 1572.

1633. BENDERS, A. M. **Onze constitutie. [Our constitution.]** Genetica 2: 301–322. July, 1920.

1634. BENDERS. [Dutch rev. of: LICHTENSTERN, R. **Bisherige Erfolge der Hodentransplantation beim Menschen. (Results thus far achieved by the transplantation of testes in man.)** Jahreskurse f. ärztliche Fortb. April, 1920.] Genetica 2: 374–375. July, 1920.

1635. BERGMAN, EMANUEL. **A family with hereditary (genotypical) tremor.** Hereditas 1: 98–106. *2 fig.* 1920.—In a Swedish family the author has observed hereditary tremor. A description of the disease and descriptions of the affected persons are given. The tremor is transmitted as a dominant in the family.—*K. V. Ossian Dahlgren.*

1636. BEZSSONOFF. **Sur l'obtention expérimentale de la sexualité chez les champignons et orientée sur la structure typique du plasma sexuel. [On the experimental production of sexuality in fungi and oriented on the typical structure of the sexual plasm.]** Compt. Rend. Acad. Sci. Paris 170: 288–290. 1920.—See Bot. Absts. 6, Entry 1344.

1637. BLARINGHEM, L. **Variations de la sexualité chez les Composées. [Variation of sexuality in the Compositae.]** Compt. Rend. Soc. Biol. [Paris] 83: 1060–1062. July, 1920.

1638. BLARINGHEM, L. **A propos de l'hérédité des fascies de Capsella Viguieri. [Concerning the heredity of fasciations in Capsella Viguieri.]** Compt. Rend. Acad. Sci. Paris 169: 298–300. 1919.

1639. BLARINGHEM, L. **Production par traumatisme d'une forme nouvelle de Mais à caryopses multiples, Zea Mays var. polysperma. [The traumatic origin of a new form of maize with multiple fruits, Zea Mays var. polysperma.]** Compt. Rend. Acad. Sci. Paris 170: 677–679. 1920.

1640. Blaringhem, L. **Variations florales chez la Grande Marguerite (Leucanthemum vulgare, Lamarck.) [Floral variation in Leucanthemum vulgare.]** Compt. Rend. Acad. Sci. Paris 169: 193–195. 1919.

1641. Boedijn, K. **Die Chromosomen von Oenothera Lamarckiana, mut. simplex. [The chromosomes of Oenothera Lamarckiana mut. simplex.]** Zeitschr. indukt. Abstamm. Vererb. 24: 71–76. Aug., 1920.

1642. Bouin, P. **Sur la dimégalie des spermies dans certaines doubles spermatogénèses. Sa signification. [On dimegaly of sperms in certain cases of double spermatogenesis. Its significance.]** Compt. Rend. Soc. Biol. 83: 432–434. Mar., 1920.—Two sorts of spermatogonia exist in *Scolopendra*, one with large, one with small chromosomes. Spermatogenesis is same in both except that growth is much greater in those with large chromosomes. Quantity of chromatin is held to cause larger growth. By analogy with another myriapod, large sperms are believed to be female-determining, small ones male-determining. Facts suggest that heterochromosome in forms that have one is merely trophic in function, that its chromatin is not different from that of other chromosomes, and that effect of its presence is due to larger amount of chromatin, not to different kind.—*A. Franklin Shull.*

1643. Bouvier, E. L., and d'Emmerez de Charmoy. **Mutation d'une Caridine en Ortmannie et observations générales sur les mutations évolutives de Crevettes d'eau douce de la famille de Atyidés. [Mutation of a Caridine into Ortmannia, and general observations on the evolutive mutations of freshwater crustaceans of the family Atyidae.]** Compt. Rend. Acad. Sci. Paris 169: 317–321. 1919.

1644. Castle, W. E. **Model of the linkage system of eleven second chromosome genes of Drosophila.** Proc. Nation. Acad. Sci. [U. S.] 6: 73–77. *2 fig.* Feb., 1920.—Bridges and Morgan's linkage data of the second chromosome of *Drosophila* form the basis of another model in three dimensions similar to those which Castle has previously published. It shows the second chromosome genes "lying roughly in a linear chain winding cork-screw fashion through the model." Gowen's data for the third chromosome have been subjected to similar treatment, and although the model is not figured the genes are said to fall "into a curved band lying nearly in one plane" in the manner pointed out by Sturtevant, Bridges, and Morgan for the sex chromosome model. It is now admitted that according to the linear idea, map distances in excess of 50 may occur, though double crossing over prevents them from being recorded, and that map distances do not correspond with crossover percentages except where the crossover values are low. The fact that one model closely approaches the linear, and that the indefinite lengthening of all the longer distances in the other—cutting of all wires over 40 units long—would straighten it out, so as to closely approach a linear system, leads to the following conclusion: "that the model supports the linear hypothesis, if it be supposed that the longer distances have been shortened by double crossing over, and that map distances in such cases should exceed crossover percentages.—*H. H. Plough.*

1645. Chodat, R. **La panachure et les chimères dans le genre Funkia. [Variegation and chimeras in the genus Funkia.]** Compt. Rend. Soc. Phys. Hist. Nat. Genève 36: 81–84. 1919.—Author studied chimera-like variegation in leaves of three species of *Funkia*. In *F. Sieboldiana* he found two contrasting types—*variegata albo-marginata* with largely white-margined leaves, and *variegata medio-variegata* with the white portion largely in the center of the leaf. Baur considers several of these variegated types, such as are found in *Euonymus* and *Pelargonium*, as periclinal chimeras. Author finds in variegated *Funkias* that none of the usually colorless sub-epidermis is present above the green regions; hence he questions considering them as periclinal chimeras, but uses this hypothesis in analyzing them. He does not consider *Funkia* variegations as reversions such as the variegations described by Bateson in *Euonymus*, because in *Funkia* the leaves are all of same type on one plant, while both normal and variegated leaves occur on the same plant in case of Bateson's studies.—In monocotyledons of the *Funkia* type the epidermis is colorless except for the green guard-

cells of the stomata. In *albo-marginata* the epidermis is entirely colorless. In the *medio-variegata* type the guard-cells are green over both the green and white regions. This was also observed in *F. ovato* f. *medio-variegata* and *F. lancifolia medio-variegata*, while in *F. lancifolia* f. *albo-marginata* the epidermis is absolutely colorless. In *F. Sieboldiana* Hook, *medio-variegata* there is an average of 18.7 stomata over the white region, and 14.5 over the green region, the stomata being much larger and less elongated over the green regions than over the colorless parts. The opposite is the case in *albo-marginata*, which averages 12.3 stomata over the green, and 11 over the white regions for the same surface area.—The origin of the variegated *Funkia* is probably a question of hybrids, the chimeras being of a disjunctive rather than of a periclinal type, some with white epidermis, and some with a green epidermis.—*Francena R. Meyer.*

1646. Coe, H. S., and J. N. Martin. **Sweet-clover seed. Part I. Pollination studies of seed production. Part II. Structure and chemical nature of the seed coat and its relation to impermeable seeds of sweet clover.** U. S. Dept. Agric. Bull. 844. *39 p., 6 fig., 5 pl.* 1920.—Brief descriptions are given of development of floral organs, ovules, pollen, and seed of sweet clover, *Melilotus alba*, mainly, and also *M. officinalis*. Self-fertilization is as effective as cross-fertilization, judging by length of time elapsing between pollination and fertilization in the two cases and also by comparative rate of embryo development. Pollen germination was 33 per cent in pure water, and from 22 to 64 per cent in cane sugar solutions with strengths from 8 to 45 per cent; germination was best in 12 per cent solution. Pollen tubes made no more growth in sugar solution than in water; so it is concluded that sugar helps in pollen germination by reducing absorption rate of water. There would seem to be no reason *per se* why pollen germination should not take place freely in the open under wet weather conditions; and germination was found to take place under these conditions.—Sweet clover plants protected to prevent access to insects had only 2.9 per cent of the flowers set seed, while unguarded plants had 66.5 per cent. The percentage of cross-pollinated flowers setting seed was 70.1, while the percentage of self-pollinated flowers setting seed was 54.9. Night-flying insects seemed to have but minor effects on fertilization. Many species of insects were found to visit sweet clover. Small insects were found to be efficient pollinators. The honey bee is evidently the most efficient pollinator of sweet clover; species of *Halictus* are often nearly as efficient. Excess moisture, in the air or soil, did not affect seed production adversely. Dry soil conditions tended to inhibit seed production.—In histological studies of permeable and impermeable (hard) seeds, the "light line" of Malpighian layer, the chemical nature of which was not determined, was found to be a determining factor. In permeable seeds minute canals were found to traverse the light line radially, allowing water to pass through. These were not visible in impermeable seeds until treated with sulphuric acid, and were then observed to be very small. Seed treatment with acid for one hour did not disintegrate light line, but rendered seeds permeable.—*L. R. Waldron.*

1647. Collins, G. N. **Waxy maize from Upper Burma.** Science 52: 48–51. July 16, 1920.—Maize with waxy endosperm has been found in Upper Burma where it is cultivated by uncivilized tribes in the inaccessible mountainous districts. It is grown chiefly for the husks, which are used as wrappers for the enormous cheroots affected by the Burmese.—Plants grown in the United States from the Burma waxy seed were very unlike those raised from the original Chinese waxy seed, but the endosperm texture proved to be genetically identical.—A survey of the region in China where the first waxy seeds were discovered has shown that this type of corn is restricted to a region within 30 miles of Shanghai, and no distinctive Chinese names differentiating the waxy from other types were found. Apparently the waxy type has been cultivated in Burma for a longer period, since there is an extensive series of named varieties and the distribution is more general.—Waxy endosperm has been found also on the Island of Mindanao by W. H. Weston, but it can not be determined whether the occurrence of this type in the Philippines is the result of a recent introduction from the Chinese source or whether it represents another of the early stations comparable with Burma and Shanghai.—The author believes the waxy endosperm to have originated in

northern Burma and to have been imported into China from this district at an early date. This conclusion supports the contention of Dr. Laufer that maize entered China from the West and not the East.—*J. H. Kempton.*

1648. Collins, G. N., and J. H. Kempton. **A teosinte maize hybrid.** Jour. Agric. Res. 19: 1–38. *Pl. 1–7. 32 fig.* 1920.—A study of a hybrid between Florida teosinte and a small variety of maize known as Tom Thumb pop. Besides possible practical agricultural applications of the product, such a cross is of especial interest genetically because of the rare opportunity of securing fertile hybrids from such widely divergent parent forms. Characters of the $F_1$ were mainly intermediate. Observations were taken on 33 character pairs of the $F_2$, being considered in groups according to certain morphological or physiological relationship. Results are presented graphically in form of distribution curves. There was the greatest freedom of recombination and, barring one or two exceptions, little evidence of alternative or Mendelian inheritance.—*L. H. Smith.*

1649. Conklin, Edwin Grant. **The mechanism of evolution in the light of heredity and development. V. The cellular basis of ontogeny and phylogeny.** Scientific Monthly 1920: 269–291. *11 fig.* Mar., 1920.—A summary and restatement of present-day conceptions of the cell in reference to ontogeny and phylogeny. The physical basis of heredity and of evolution is contained in the germ cells, which form the only living bond between generations and between species. There is "no fundamental distinction" between germ cells and somatic cells. Up to an undetermined critical stage, either may under certain conditions give rise to the other. There are, however, marked morphological and physiological differences between the germplasm (nucleus) and somatoplasm (cytoplasm). The individuality of the chromosomes "is no longer a mere hypothesis, but an established fact;" and every chromomere will probably be found to have a distinct and continuous entity, the number remaining constant for every species. The smaller units which enter into the organization of the cell are alive, as is the whole cell. These divide equally, not differentially. Variations in combinations of vital units are responsible for "all forms of differentiation, variation, and evolution." The problem of the mechanism of heredity must be studied both from the side of cytology and of genetics. All the evidence at hand strengthens the assumption that genes have a linear arrangement in the chromosomes. A statement and brief discussion of the facts, as known today, regarding mitosis in general, meiosis, fertilization, sex determination, sex-linked characters, linkage, "cross-overs," etc., lead clearly to the conclusion that the inheritance units or genes or Mendelian factors are carried in the chromosomes.—*Margaret C. Ferguson.*

1650. Conners, C. H. **Some notes on the inheritance of unit characters in the peach.** Proc. Amer. Soc. Hortic. Sci. 16: 24–36. (1919) 1920.—Blossoms of peaches are classified as large, medium, and small. Of 50 trees of a self-pollinated small variety, 46 bore small-sized blossoms. Crosses between small- and large-blossom varieties gave first generation seedlings with medium-sized blossoms.—Varieties with medium-sized blossoms, when self-pollinated, gave large-, medium-, and small-blossom seedlings in percentage ratios of 18.6, 58.2, and 23.3, respectively.—Medium crossed with small gave large-, medium-, and small-blossom seedlings in percentage ratios of 4.5, 61.4, and 34.1, respectively. Medium crossed with large gave large-, medium-, and small-blossom seedlings in percentage ratios of 36.5, 58.7, and 4.9, respectively.—The breeding behavior for color of fruit, date of ripening, and freestone *versus* clingstone, is given for various "selfed" varieties and crosses.—*Fred Griffee.*

1651. Copeman, S. Monckton. **Experiments on sex determination.** Proc. Zool. Soc. London 1919: 433–435. Feb., 1920.—Rabbits were semicastrated or semi-spayed either on the left or the right side, and then bred with animals which had had a similar operation or with entire animals of the opposite sex. This was done in an attempt to determine whether the right or left gonads were prepotent in determining the resulting sex of the offspring. The results were contradictory, and the general conclusion was that the reproductive cells of a gonad may give rise to either sex.—*D. D. Whitney.*

1652. CORRENS, C. **Vererbungsversuche mit buntblättrigen Sippen. III. Veronica gentianoides albocincta. IV. Die albomarmorata- und albopulverea-Sippen. V. Mercurialis annua versicolor und xantha. [Genetical studies with variegated races. III. Veronica gentianoides albocincta. IV. The albomarmorata and albopulverea races. V. Mercurialis annua versicolor and xantha.]** Sitzungsber. Preuss. Akad. Wiss. Berlin 6, 7: 212–240. 1920.

1653. CRANDALL, C. S. **The apple cross—Tolman × Malus Toringo.** Proc. Amer. Soc. Hortic. Sci. 16: 60–66. (1919). 1920.—Cross between Tolman, a standard variety of apple, and a dwarf form of *Malus Toringo* gave $F_1$ seedlings intermediate for characters studied, but more nearly approaching dwarf parent.—See also Bot. Absts. 6, Entry 1148.—*Fred Griffee.*

1654. CZUBER. **Die Anwendung der Wahrscheinlichkeitsrechnung auf Fragen der Landwirtschaft. [The application of probability calculations to agricultural questions.]** Zeitschr. Landw. Versuch. Österreich. 1918: 1–100. 1918.

1655. DANFORTH, C. H. **Observations on brachydactylism in the fowl.** Anat. Rec. 14: 33–34. 1918.—Author's abstract of paper presented at the Thirty-fourth session of the American Association of Anatomists, Dec. 29, 1917.—A form of brachydactylism affecting particularly the fourth digit is of common occurrence in the fowl. It is usually associated with booting (feathered tarsi). The extent to which the fourth toe is shortened ranges from a condition in which all five phalanges are present, but with a total length slightly less than normal, to a condition in which the toe is greatly shortened and the number of phalanges reduced to two. The fourth phalanx is the first to be affected, followed by the third, and then by the fifth. The skeletal elements seem to disappear through a process of coalescence rather than one of suppression.—Examination of developmental stages show that the brachydactyl digits are already noticeably shortened at a time when the cartilaginous anlagen of the phalanges are still in a rudimentary condition, which suggests that the brachydactylism is due not to a defect inherent in the skeletal system, but more probably to an influence that acts on the toe as a whole. The possibility of booting as a causative factor seems to be definitely eliminated by the fact that brachydactylism may be clearly apparent before the first feather germs appear on the tarsi. It seems probable that both conditions are induced by some common cause, which is effective from the eighth to the tenth day of incubation.—Breeding records indicate that brachydactylism is transmitted in about the same proportions as polydactylism and booting. With the latter it shows a close correlation; with the former, none.—*C. H. Danforth.*

1656. DANIEL, LUCIEN. **Sur la stabilité et l'hérédité de Crataegomespilus et des Pirocydonia. [On the stability and heredity of Crataegomespilus and of Pirocydonia.]** Compt. Rend. Acad. Sci. Paris 169: 513–515. 1919.

1657. DAVENPORT, C. B. **Department of Experimental Evolution.** Carnegie Inst. Washington Year Book 18 (1919): 123–152. 1920.—Director reports that during 1919 scientific work of the Station emerged from quiescence imposed by the war. C. W. METZ, working with *Drosophila virilis*, *D. obscura* and *D. willistoni*, discovered 23 new mutant characters from March to July. E. C. MACDOWELL reports no new experimental facts on effects of alcohol on rats, but presents further surveys of data previously collected. One such survey points to mental inferiority of rats descended from alcoholized grandparents as compared with controls from normal ancestors. Cytological studies (by E. ALLEN) on testes of control and alcoholized rats revealed degeneration in both, but much more in alcoholized rats. A biometrical treatment by MACDOWELL on data already reported on selection for bristle number during 54 generations of *Drosophila* confirmed previous conclusions that no selection effect was perceptible after first few generations. Compilation by A. M. BANTA of data on selection for speed of light reaction in daphnids showed no effective selection except in one line. E. H. BEHRE found that stale sperm in pigeons does not affect sex-ratio. BANTA continued observations on sex-intergrading daphnids along two lines: (1) detailed study of

degrees of intergrading, which revealed all conceivable intermediate stages with maleness and femaleness blended and not in sexual mosaics as in gynandromorphs, and showed that the degree of maleness in different parts of a single individual varied; (2) selection within intergrade stocks descended from one original mother toward pure femaleness, which has given results in direction of selection. BANTA has continued comparative studies on cave animals raised in light and epigaeal animals raised under cave conditions. C. C. LITTLE, using records of Sloane Maternity Hospital of New York, found ratio of male to female birth from parents of same race to be 106.27, while in "hybrid" matings this ratio was 121.56; it would seem from this that male-producing sperms are less likely to be eliminated. LITTLE has also reviewed literature on cats, doves, and canaries to see how completely facts of inheritance agree with general crossing-over and non-disjunction hypotheses. With MISS E. E. JONES he has studied heredity of color in dogs, basing conclusions on stud books of American Kennel Club; three double allelomorphic and one triple allelomorphic series have been found. Genetical experiments have been pursued also on sheep, mice, and poultry. OSCAR RIDDLE, with collaborators, has completed demonstration of nitrogen reduction in eggs accompanying quinine dosage, and of fact that brains of ataxic birds lack chemical differentiation. Of work of Eugenics Record Office reference is made to H. J. BANKER's studies; to C. B. DAVENPORT's studies of statistics on drafted men for Surgeon General's Office, Washington; to DAVENPORT and SCUDDER's contribution on naval officers, which showed that hereditary traits—i.e., hyperkinesis, thalassophilia, and nomadism—determined superiority; and to MISS M. M. STURGES's investigation of isolated inbred communities. H. H. LAUGHLIN has prepared a work on eugenical sterilization in the United States, and has made statistical inquiries on elimination of mongrel blood in pure-sire system of out-breeding. Much eugenical material has been added to archives during the year.—*James P. Kelly.*

1658. DAVENPORT, C. B. **Hereditary tendency to form nerve tumors.** Proc. Nation. Acad. Sci. **4**: 213–214. Aug., 1918.—Multiple neurofibromatosis, a condition due mostly to the proliferation of connective tissue in nerve sheaths, shows a strongly familial tendency. It is not limited to either sex and is generally transmitted after the fashion of a Mendelian dominant. In a few instances a generation has been skipped, but these occurrences are probably to be explained on the basis of an occasional failure of dominance. The symptoms of the disease are diverse, but within a given family they are generally rather uniform. The fact that these neurofibromata are hereditary tends to strengthen the view that cancers in general have an hereditary basis.—*C. H. Danforth.*

1659. DUARTE D'OLIVEIRA, JOSÉ. **Sur la transmission de la fasciation et de la dichotomie a la suite de la greffe de deux vignes portugaises. [The transmission of fasciation and dichotomous branching through the grafting of two Portuguese varieties of grapes.]** Compt. Rend. Acad. Sci. Paris **170**: 615–616. 1920.—See Bot. Absts. 6, Entry 1151.

1660. DUERDEN, J. E. **Inheritance of callosities in the ostrich.** Amer. Nat. **54**: 289–312. *7 fig.* July–Aug., 1920.—Author describes several callosities appearing regularly on body of the ostrich, distinguishing three classes: (1) those inherited (because constantly present before hatching), and functioning under certain circumstances as cushions bearing the weight of the bird, or as friction pads; (2) those inherited, but not now functioning; and (3) those which are direct individual responses of the skin to contact, involving pressure and friction, with hard substances. Callosities of latter class may be developed on the skin of other parts of body, and presumably on any part. Callosities of all three classes are similar in structure. The author suggests that those of classes 1 and 2 originally arose as adaptive responses, which have since become transmissible. Those of class 2 are no longer used, owing to certain structural changes in body. Those of class 3, necessitated by same structural changes, have as yet not become heritable. He states that "a character may become transmissible without necessarily being germinal, in the sense of having factorial representation in the germ plasm;" and that "acquired characters are such somatic modifications as are produced as responses of the organs and tissues to stimuli, and are without direct representation in the germ plasm." —*William A. Lippincott.*

1661. EDLER, W. **Die Verzweigung der Ackerbohne. [Branching of field beans.]** Fühlings Landwirtsch. Zeit. 1919: 441–450. 1919.—An account is given of a ten years' mass selection experiment on varieties of *Vicia faba*. Branched and unbranched plants started groups within each variety. Within each group the choosing of branched and unbranched plants, respectively, was repeated. Branched plants in most seasons are more common in selections toward branching than in those toward single-stemmed condition, but increase in tendency toward branching has not been obtained after ten years' work. Outside conditions affect branching very markedly. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 210. June, 1920.]—*J. P. Kelly.*

1662. EHINGER, K. **Ein neuer tertiärer Deilephila-Hybride. [A new tertiary Deilephila hybrid.]** Entomol. Rundschau 37: 2–4, 7–8. 1920.

1663. ELLINGER, TAGE. [German rev. of: CUSHING, H. **Hereditary anchylosis of the proximal phalangeal joints (symphalangism).** Genetics 1: 90–106. *11 fig.* Jan., 1916.] Zeitschr. indukt. Abstamm. Vererb. 24: 104. Aug., 1920.

1664. ELLINGER, TAGE. [German rev. of: SCHMIDT, J. **Investigations of hops (Humulus lupulus). XI. Can different clones be characterized by the number of marginal teeth in the leaves?** Compt. Rend. Lab. Carlsberg 14: 1–23. *8 fig.* 1918. (See Bot. Absts. 3, Entry 2192.)] Zeitschr. indukt. Abstamm. Vererb. 24: 101. Aug., 1920.

1665. FAWCETT, W. **Cebras e híbridos como animales domesticados. (Zebras and their hybrids as domestic animals.)** La Hacienda 13: 242–245. *9 fig.* 1918.—Popular review of experiments in which zebras have been crossed with horses or asses, with special regard to the possible usefulness of the hybrids as farm animals.—*Sewall Wright.*

1666. FIRKET, JEAN. **Recherches sur l'organogénèse des glandes sexuelles chez les oiseaux. [Researches on the organogenesis of the sexual glands in birds.]** Arch. Biol. 30: 395–516. *6 pl., 5 fig.* 1920.

1667. FISCHER, H. **Pflanzenmetamorphose und Abstammungslehre. [Plant metamormorphosis and evolution.]** Die Naturwissenschaften 8: 268–271. 1920.

1668. FRÖLICH, G. **Die Umzüchtung von Wintergetreide in Sommergetreide. [The breeding of winter cereals into spring cereals.]** Friedrichswerther Monatsber. 9: 27–30. 1919.—In an experiment begun in 1906 to change by breeding the Friedrichswerther Squarehead barley into a summer sort, no shortening of period of time from sowing of seeds to shooting was obtained up to 1918. When considering influence of spring planting one must keep in mind the effects of selection of those plants that send up stalks earliest. Author noted that spring-sown barley gave a lessened crop, much stooling (Bestockung), and an absence of stalks in some plants. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 118. Dec. 1919.]—*J. P. Kelly.*

1669. FRÖLICH, G. **Die Beeinflussung der Kornschwere durch Auslese bei der Züchtung der Ackerbohne. [The influencing of seed weight by selection in the breeding of field beans.]** Friedrichswerther Monatsber. 9: 7–8, 17–20. 1919.—Author experimented to test report that in Thüringen, due to local external conditions, seed weight of field bean decreased. Individual seed weight proved strongly modifiable, considering weights for separate years; but a general decrease due to place conditions was not found. An increase in weight by selection within limits of a particular individual was in general without success. In some cases tendency was noted for branches to occur with higher separate seed weight, which author referred to occasional cross-pollination. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 117. Dec., 1919.]—*J. P. Kelly.*

1670. Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 3. Die Züchtung von Kartoffel, Erdbirne, Lein, Hanf, Tabak, Hopfen, Buchweizen, Hülsenfrüchtern und kleeartigen Futterpflanzen. [Handbook of agricultural plant breeding. 3. The breeding of potatoes, Jerusalem artichokes, flax, hemp, tobacco, hops, buckwheat, legumes, and clover-like forage plants.]** *3rd ed., 240 p., 45 fig.* Paul Parey: Berlin, 1919.—In present edition of this volume section on potatoes is fundamentally revised. Considerable change is made also in portions devoted to breeding of flax, hops, and tobacco. Presented in this edition for first time is discussion on breeding of Soy beans (*Soja*). Author touches on his own researches in potatoes, hemp, legumes, and clovers. There is an increase of 17 pages and 10 figures over last edition. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 222–223. June, 1920.] —*J. P. Kelly.*

1671. Fruwirth, C. **Die Saatenanerkennung. [Seed recognition.]** *iii + 126 p., 66 fig.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1586.

1672. Gager, C. Stuart. **Heredity and evolution in plants.** *14 × 20 cm., xi + 265 p., 113 fig.* P. Blakiston's Son & Co.: Philadelphia, 1920.—Represents essentially a reprinting, with minor modifications, of chapters 31–38 of the author's "Fundamentals of botany," to which have been added a chapter on geographical distribution (p. 139–182) and one on the great groups of plants (pp. 243–251). A classified bibliography of books and a brief list of journals are also new. All but three of the books listed are in English, and the only foreign journals cited are the "New Phytologist," London, and the "Revue général de botanique," Paris.—*G. H. Shull.*

1673. Gardner, V. R. **Results of bud selection investigations at the Missouri and Oregon experiment stations and their interpretation.** Proc. Amer. Soc. Hortic. Sci. 16: 66–70. (1919) 1920.—Scions from high- and low-yielding Ben Davis trees (*Pyrus malus*) proved of equal value. Likewise, ten years selection for high and low yield in a standard strawberry variety had no effect on productiveness. Cases of degeneration in several seedling strawberries are given. This degeneration in one case involved the entire stock; in another case, only a part of the plants of a variety.—Crosses of wild *Fragaria chiloensis* with a cultivated variety gave mostly seedlings bearing petioles with appressed and ascending pubescence like that of the wild form. Some seedlings had petioles with spreading pubescence like that of the cultivated variety. One seedling bore petioles of both types. Propagations from this seedling gave daughter plants, some of which were like the wild form, some like the cultivated variety, and others with petioles of both types.—Author points out importance of eliminating degenerates as a means of keeping a variety up to standard. [See also Bot. Absts. 6, Entry 1155.]—*Fred Griffee.*

1674. Gates, R. R. **A preliminary account of the meiotic phenomena in the pollen mother-cells and tapetum of lettuce (Lactuca sativa).** Proc. Roy. Soc. 91: 216–223. *2 fig.* May, 1920.—A study of the pollen development of the Dwarf Perfection lettuce and a rogue from it, revealed no constant cytological difference between the variety and its rogue; but certain interesting features were observed in both. The elongated tapetal cells lie parallel with the longer axes of the loculi. In the binucleate phase of the tapetal cells the nuclei often present in appearance various synaptic stages. Every transition occurs between microspore mother-cells and tapetal cells. The members of a bivalent chromosome lie side by side and chiasmatypy often occurs. The author states that this phenomenon is here described for the first time in plants. There are 9 pairs of chromosomes, which fall into 3 groups as to size. The 10 chromosomes sometimes found in diakinesis may have resulted from the separation of the members of a pair or from a transverse segmentation of one of the bivalent chromosomes. The number of chromosomes may be reduced to 8 or 7 by a more or less complete fusion, end to end, of two bivalent chromosomes. The manner of coalescence of these chromosomes furnishes a probable basis for the phenomena of coupling or repulsion. The microspore mother-cells are divided into tetrads by cytoplasmic intrusions from the wall. These have no connection with the spindle. The few pollen grains maturing in a loculus are surrounded by a "cytoplasmic detritus from the tapetum."—*Margaret C. Ferguson.*

1675. GAUGER, MARTIN. **Die Mendelschen Zahlenreihen by Monohybriden im Lichte der Dispersionstheorie. [The Mendelian ratios in monohybrids in the light of the dispersion theory.]** Zeitschr. indukt. Abstamm. Vererb. 22: 145–198. Mar., 1920.—The author examines numerical results of a number of breeding experiments and concludes that ratios actually observed agree with ratios of Mendelian theory as nearly as can be expected after taking account of the mathematically probable deviations of the series observed.—*R. B. Robbins.*

1676. GOLDSCHMIDT, RICHARD. **Untersuchungen über Intersexualität. [Investigations on intersexuality.]** Zeitschr. indukt. Abstamm. Vererb. 23: 1–199. *2 pl., 84 fig.* 1920.

1677. GRÄFENBERG, E. **Die entwicklungsgeschichtliche Bedeutung der Hyperdaktylie menschlicher Gliedmassen. [Developmental significance of hyperdactyly in human extremities.]** Stud. z. Pathol. d. Entwickl. 2: 565–619. 1920.

1678. GUTHERZ, S. **Das Heterochromosomen-Problem bei den Vertebraten. Erste Mitteilung: Untersuchung der frühen Oogenese der Hauskatze. [The heterochromosome problem in vertebrates. I. Study of the early oogenesis of the domestic cat.]** Arch. Mikros. Anat. 94: 338–364. 1920.

1679. GUYER, M. F., AND E. A. SMITH. **Transmission of eye-defects induced in rabbits by means of lens-sensitized fowl-serum.** Proc. Nation. Acad. Sci. (U. S.) 6: 134–136. Mar., 1920.—A brief account of experiments in which the writers appear to have been able to induce specific antenatal lens-defects in rabbits, transmissible to later generations even through the male line, by treatment of pregnant females with fowl-serum previously sensitized to rabbit-lens. Among 61 surviving young of such treated females, there were conspicuous eye-defects in 4 cases and noticeable defects in 5 others. No such eye-defects were found in untreated rabbits or in control treated with unsensitized fowl-serum (12 cases) or with fowl-serum sensitized to another rabbit tissue (36 cases). Similar eye-defects were also occasionally induced in mice by similar methods. The defective eyes in rabbits have been transmitted for 6 generations with increasing severity.—*Sewall Wright.*

1680. HAECKER, V. **Über Regelmässigkeiten im Auftreten erblicher Normaleigenschaften, Anomalien und Krankheiten beim Menschen. [On regularity in the occurrence of hereditary normal characteristics, anomalies and diseases in man.]** Mediz. Klinik. 14: 977–982. 1918.—The mode of inheritance of a trait is dependent upon the germinal complex which enters into the zygote and also upon the developmental relations of the organ or part in which the trait appears—the ontogenetic factor. If the part concerned has a high degree of developmental autonomy—that is, if it acquires relative independence at an embryologically early period—the trait is transmitted in ordinary Mendelian fashion. If there is a low degree of autonomy with a consequent involvement of various developmental influences, simple Mendelian heredity with segregation of traits does not occur, but, instead, a blending type from which neither of the original parental forms is ever reproduced in any subsequent generation. The blue eye color of certain Eskimos and others, shows the long-continued persistence of an autonomous, and consequently Mendelian, character; the slightly mongoloid features of some Hungarians and Turks represent the last vestige of blending traits. What sometimes appears as a single trait need not necessarily be such. For example, in the case of albinism there is an autonomous and a degenerative type. The former behaves in a clearly cut Mendelian fashion, while the latter, which is in reality the labile expression of a generalized degenerative condition, behaves in an irregular manner alternating with, or being accompanied by, various other aberrant conditions. Among digital anomalies, hypophalangy—a trait presumed to be due to a single factor directly affecting only skeletogenous elements and therefore displaying a high degree of autonomy—is a good Mendelian trait, while polydactyly—due to factors affecting several different elements and thus showing a low degree of autonomy—is transmitted irregularly and is often replaced by some other condition such as syndactyly.—The characteristic failure of blending characters to show Mendelian heredity may be due (1) simply to the extremely polyhybrid nature of the cross, (2) to a redistribution of the

genes between pairs of homologous chromosomes, or (3), especially in the case of disease conditions, to a tendency on the part of the germplasm to return by degressive mutations to the normal and presumably more stable condition.—*C. H. Danforth.*

1681. Hansen, W. **Einiges über Rübenzucht. [Something about beet-breeding.]** Illustr. Landw. Zeitg. 39: 154–156. 1919.—Author advocates permitting open-pollination among best mother-beets and subsequent evaluation based on progeny performance. A single seed obtained under a gauze bag gave a poor result as revealed by progeny test. Determination of dry weights of beets in addition to polarization was deemed unnecessary. Suggests designating beet by letters in genetical studies. [From author's abstract in Zeitschr. Pflanzenzücht. 7: 120. Dec., 1919.]—*J. P. Kelly.*

1682. Hansen, W. **Die Pflanzenzüchterische Buchführung und Bewertung der Zuchtpflanzen. [Plant-breeding book-keeping and evaluation of the parent plants.]** Zeitschr. Pflanzenzücht. 6: 119–138. *2 fig.* Dec., 1918.

1683. Hansen, W. **Gedanken über Organisation und Arbeitsersparnis in der Pflanzenzucht. [Thoughts on organization and labor-saving in plant breeding.]** Deutsch. Landw. Presse 1918: 261–262. 1918.—See Bot. Absts. 6, Entry 1587.

1684. Hansen, W. **Die Ermittlung des Einzelkorngewichtes einer Pflanze. [Determination of the weight of individual grains of a plant.** Zeitschr. Pflanzenzücht. 7: 225–227. June, 1920.

1685. Hargitt, George T. **Coelenterates and the evolution of germ cells.** Anat. Rec. 17: 327. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—In the Hydrozoa the observations upon germ-cell origin and segregation, budding, regeneration, and development from dissociated cells have led to the following conclusions: All cells of the body (except possibly the nettling and nerve cells) are capable of further differentiation in various directions; this includes the power of dedifferentiation and of specialization in a new direction. There cannot be, therefore, any real distinction between body cells and germ cells.—Specialized cells of other adult animals (including vertebrates) show, in varying degrees, the power of dedifferentiation and new specialization. The capacity for specialization in different directions is universally present in the cells of embryos or of larvae, and sometimes throughout the youthful stages. But there is a time in ontogeny when further specialization of cells involves the loss of capacity for any new differentiation; this is the period at which germ cells are usually segregated into a distinct tissue. In the higher organisms this may occur early in ontogeny; in Hydrozoa it never occurs.—*George T. Hargitt.*

1686. Harland, S. C. **Studies of inheritance in cotton. I. The inheritance of corolla colour.** West Indian Bull. 18: 13–19. 1920.—"It would easily be possible to collect a hundred or more different pure-breeding West Indian natives." Existence of so large a number of homozygous biotypes is attributed to long-continued isolation in gardens. Present paper deals with artificial hybrids of some of the "native" cottons with Upland and with Sea Island.—Author distinguishes 6 grades of color from white (grade 0) to very deep yellow (grade 5), all breeding true. Ten different combinations were made among these. "A cross between any two of the above shades gave an intermediate $F_1$. In all $F_2$ families, the parental and $F_1$ color types appeared, but there may have been other intermediate colour forms in addition." In $F_2$ of the most extreme cross ($0 \times 5$) the distribution was: very deep yellow, 1; intermediate, 72; white, 4. An $F_3$ of this combination was not grown. The combination $0 \times 3$ gave in $F_2$ a ratio of 4.4 yellow : 1.0 white. In $F_3$, 8 families from $F_2$ yellows produced yellows only, and 27 families from $F_2$ yellows produced yellows and whites in an approximately 3 : 1 ratio, but with considerable deviation from this ratio in certain families. Of 11 families from $F_2$ whites, 6 produced an occasional yellow in $F_3$, but possibility of accidental cross-pollination as an explanation is not excluded. "It is not without hesitation that the hypothesis that medium yellow and white constitute an allelomorphic pair is put forward."—*T. H. Kearney.*

1687. Harman, Mary T. **Chromosome studies in Tettigidae. II. Chromosomes of BB, CC, and the hybrid BC in the genus Paratettix.** Anat. Rec. 17: 329. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—BB, CC, and their hybrids, BC (Nabours, 1914 and 1917), are the only forms considered in this paper. Six pairs and an unpaired chromosome are present in the spermatogonia. In BB the chromosomes of the third pair, according to size, taper toward one end and are bent so as to have almost the appearance of a hook. In CC the chromosomes of this pair are nearly oval. In the hybrid, BC, this pair of chromosomes is composed of an oval chromosome like that in CC and a bent chromosome like that in BB. The difference in this homologous pair of chromosomes is recognized at the end of the growth period previous to the formation of the chromosomes of the first maturation spindle.—The diploid number of chromosomes appears at the end of the growth period previous to the formation of the bivalent chromosomes. The bivalent chromosomes are formed by an end-to-end union of the homologous pairs of these chromosomes before they have been completely condensed. The sex chromosome may be recognized at all stages.—In the first maturation division the bivalent chromosomes separate at the line of union, and the sex chromosome goes to one pole undivided. The formation of the diploid number of chromosomes at the end of the growth period and the union, end to end, of their homologous pairs may explain the absence of any crossing-over in *Paratettix.—Mary T. Harman.*

1688. Hartwell, Burt L. **Thirty-second annual report of the Director of the Rhode Island Agricultural Experiment Station.** Bull. Rhode Island State Coll. 15: 69–84. Feb., 1920.—Brief statement on pages 82, 83, of inheritance studies with poultry and rabbits.—*G. H. Shull.*

1689. Heribert-Nilsson, Nils. **Zuwachsgeschwindigkeit der Pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana. [Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.]** Hereditas 1: 41–67. *1 fig.* 1920.—Author has investigated the rate of growth of pollen tubes by cutting off the base of the style at certain intervals of time after pollination. Temperature influences considerably the velocity of growth of the pollen-tubes.—*Rr* (red-nerved) × *rr* (white-nerved) give the typical Mendelian segregation 1 : 1. The inverse cross (*rr* × *Rr*) gives too large proportion of red-nerved plants. The *R* tubes grow more rapidly than the *r* tubes, and consequently fertilize a number of eggs before the *r* tubes arrive. in 1918 segregations up to 4:.1 were obtained. Competition between *R* and *r* is termed *certation*, and the cross *rr* × *Rr* a *certation-cross*. The inverse cross is called an *equation-cross*. Difference in the influence of temperature between the *R* and *r* tubes is to be interpreted in such a way as to explain the slow growth of the *r* tubes becoming relatively still more retarded when the temperature falls.—By self-fertilization of *Rr* plants we meet besides certation other complications. All the red-nerved plants are heterozygous, *Rr*. The combination *RR* can not be produced. Consequently a segregation in the ratio 2 *Rr*: 1 *rr* is to be expected. However, the author obtained too many *Rr* plants. No elimination of *RR* zygotes takes place, but there is a repulsion between the *R* gametes, a "prohibition." All the *R* eggs are fertilized by *r* pollen. The compensation of the *R* pollen with *r* pollen in the fertilization of the *R* eggs receives the name *"substitution."* Thus the ratio 2 *Rr* + 1 *rR* to 1 *rr* is obtained; that is, the segregation 3: 1. By coöperation of certation the segregation is found to be 6: 1 in extreme cases. The irregular segregation stated by de Vries can be explained by the complications characteristic of the factor *R*. The more *Oenothera Lamarckiana* is examined, the more the variability proves itself not to be a phenomenon *sui generis.—K. V. Ossian Dahlgren.*

1690. Heribert-Nilsson, N. [German rev. of: von Hofsten, N. **Ärftlichetslära. [Genetics.]** *17 × 26 cm., viii + 506 p., 191 fig., 1 colored pl.* P. A. Norstedt & Söners förlag: Stockholm. 1919. (See Bot. Absts. 3, Entry 2208.)] Zeitschr. indukt. Abstamm. Vererb. 24: 98. Aug., 1920.

1691. Herlant, Maurice. **L'acide carbonique comme agent de parthénogénèse expérimentale chez l'oursin (Paracentrotus). [Carbonic acid as an agent of experimental parthenogenesis in the sea-urchin (Paracentrotus).]** Compt. Rend. Soc. Biol. 83: 188–190. 1920.

1692. Hertwig, Günther. **Das Schicksal des väterlichen Chromatins im Kreuzungsexperiment. [The fate of paternal chromatin in the crossing experiment.]** Arch. Mikrosk. Anat. 94: 288–302. *1 fig.* July 15, 1920.

1693. Hertwig, Oscar. **Allgemeine Biologie. [General biology.]** 5th ed., improved and enlarged, *8vo., xvi + 800 p.* Gustav Fischer: Jena, 1920.

1694. Hertwig, Paula. **Abweichende Form der Parthenogenese bei einer Mutation von Rhabditis pellio. Eine experimentell cytologische Untersuchung. [Aberrant form of parthenogenesis in a mutation of Rhabditis pellio. An experimental cytological study.]** Arch. Mikros. Anat. 94: 303–337. 1920.

1695. Hertwig, Paula. **Haploide und diploide parthenogenese. [Haploid and diploid parthenogenesis.]** Biol. Zentralbl. 40: 145–174. April–May, 1920.—Summary of known facts concerning maturation and development in artificial and physiological parthenogenesis. Stimuli to artificial parthenogenesis are classed as chemical, physical, and biological. Time at which stimulation acts determines, in different material, whether development starts with diploid or haploid number of chromosomes. As a rule number is haploid. Later, from natural or artificial causes, it may become diploid. Specific examples are given, and literature is cited. Development of artificially parthenogenetic eggs is mostly of short duration. Author points out that complete development in presence of only haploid number of chromosomes has so far proven impossible. Defect is hardly in mere number of chromosomes, but perhaps in interrelation of nucleus, protoplasm, and yolk. It is questionable whether normal development can occur even in physiological parthenogenesis in presence of haploid number of chromosomes. Evidence at hand does not prove that it can.—Cases are mentioned in which natural parthenogenesis occurs in animals in absence of reduction, and comparable phenonena in plants are described. In no case in plants has development occurred with haploid nuclei in a generation normally diploid. In animals of Hymenopteran type, egg undergoes normal reduction whether it later develops parthenogenetically or is fertilized, and sex depends on presence or absence of fertilization. In some of those developing parthenogenetically with haploid nuclei, number of chromosomes is later doubled, at least in somatic cells. Cytology of honey bee is critically considered in this connection.—*A. Franklin Shull.*

1696. Hochè, Léon, and René Morlot. **Evolution parthénogénétique de l'ovule dans l'atrophie de follicule a l'état de maturité. [Parthenogenetic development of the egg to maturity in a case of atrophy of the follicle.]** Compt. Rend. Soc. Biol. 83: 1152–1154. July, 1920.

1697. Hromádko, J. **Variabilität der Nachkommenschaft derselben Futterrübenmutter in der 1. Generation. [The variability of progenies of the same mother beet in the first generation.]** Zeitschr. Zuckerindus. Böhmen 42: 581–601. 1918.

1698. Jollos, Victor. **Experimentelle Vererbungsstudien in Infusorien. [Experimental studies of heredity in Infusoria.]** Zeitschr. indukt. Abstamm. Vererb. 24: 77–79. Aug., 1920.

1699. Jones, D. F. **Selective fertilization in pollen mixtures.** Biol. Bull. 38: 251–289. May, 1920.—By the use of the ingenious system of reciprocal crosses the author shows decisively that in *Zea mays* self-fertilization, although detrimental to the development of the progeny, is favored at the expense of cross-fertilization. Using the increase in the percentage of the cross-pollinated seeds as an indication of the germinal differences between the parents, the author calculated the correlation coefficient between the percentage of increase and the percentage of deviation in favor of self-fertilization, and found it to be $0.496 \pm 0.093$. He concluded from this coefficient that, "In proportion as the cross-fertilization benefits the

immediate progeny in its development the less effective is that pollen in accomplishing the union." The experiments with maize involved the classification of 63,000 seeds, arising from the use of 22 pollen mixtures, obtained from twelve strains. Of the 20 m xtures which were analyzed on seed characters alone, 17 showed selective fertilization in favor of the plant's own pollen, while three of the mixtures showed the opposite effect. S milar results were obtained in *Lycopersicum esculentum*, but the data were not so extensive. The author attributes the differential fertilization to the more rapid growth of pollen tubes in the stigmas of the parent plant and suggests anaphylaxis as a possible cause of the selective action.—*J. H. Kempton.*

1700. JONES, D. F. **Selective fertilization in pollen mixtures.** Proc. Nat on. Acad. Sci. U. S. **6**: 66–70. Feb., 1920.—Pollen of A and B types of corn was thoroughly mixed and applied to silks of both A and B. Resulting ears showed mixtures of hybrid and self-fertilized seed, distinguishable by endosperm characters. Ratio of selfed to crossed seeds on A ears should have had same value as ratio of crossed to selfed on B, provided no selective pollination occurred. In 20 extensive experiments, results of 3 showed foreign pollen favored, 17 showed own pollen favored, 15 of which were unquestionably significant. Less extensive exper ments on tomato gave similar but not conconclusive results. Results were surprising in view of advantages of hybrid vigor. It was further shown that the wider the cross, the more was own pollen favored; "in proportion as the cross-fertilization benefits the progeny, the less effective are the germ cells in accomplishing fertilization." Results were the same irrespective of vigor or heterozygosity of parents used. Idea is refuted that union of d verse sexual elements stimulates growth through upsetting balance in protoplasm; instead. hybrid vigor is explained on basis of pure inheritance. Other things being equal, it is homogeneity in protoplasmic structure that favors highest developmental efficiency.—*Merle C. Coulter.*

1701. JONES, D. F. [Rev. of: COULTER, JOHN M., AND MERLE C. COULTER. **Plant genetics.** *13 × 19 cm., ix + 214 p., 40 fig.* Univ. Ch cago Press: Chicago. July, 1918. (See Bot. Absts. 2, Entry 395.)] Science **48**: 346–347. Oct. 4, 1918.

1702. JUST, GÜNTHER. **Der Nachweis von Mendel-Zahlen beim Formen mit niedriger Nachkommenzahl. Eine empirische Prüfung der Geschwister- und Probandenmethode Weisbergs auf Grund von Kreuzungsversuchen mit Drosophila ampelophila Löw. [The determination of Mendelian ratios in forms with low number of offspring. An empirica test of Weisberg's methods on the basis of crossing exper ments with Drosophila ampelophila Löw.]** Arch. Mikros. Anat. **94**: 604–652. 1920.

1703. KALT, B. **Der Begriff "Originalsaatgut" und seine Anwendung bei der Züchtungsanerkennung. [The concept "original seed" and its application in the recognition of breeding.]** Fühlings Landwirtsch. Zeit. 1919: 460–471. 1919.

1704. KAMMERER, PAUL. **Dunkeltiere im Licht und Lichttiere im Dunkel. [Darkness animals in light and light animals in darkness.]** Naturwissenschaften **8**: 28–35. 1920.

1705. KIESSLING, L. **11. Bericht der bayrischen Landessaatzuchtanstalt in Weihenstephan. (1914–1918). [11th report of the Bavarian Seed-breeding Institution at Weihenstephan (1914–1918).** Landw. Jahrb. f. Bayern 1919: 1–178. 1919.—General report for years 1914–1918 presented under seven following headings: (1) History of institution, in connection with which is given picture of C. KRAUS, founder. (2) Researches of institution; accounts of breeding work presented here and of agreements concerning delivery of pedigreed seed-stock for increase or further breeding. (3) Extension work and publications. (4) Bavarian seed-breeding localities; given here are principles governing creation of increase stations. (5) Section on promotion of seed-growing, where statistics on variety classification at certain places and where discussion of stations for culture of potato and vegetable seeds are given. (6) Agricultural promotion work. (7) Associational work of district agricultural societies, of Bavarian Seed-breeding Union and of Beet ("Rüben") Breeding Union. [Prepared from anonymous review in Zeitschr. Pflanzenzücht. 7: 213–214. June 1920.]—*J. P. Kelly.*

1706. Kiessling, L. **C. Kraus.** Zeitschr. Pflanzenzücht. 6: 222–225. Dec., 1918.

1707. Kiessling, L. **Die Leistung der Wintergerste und deren züchterische Beeinflussung. [The yield of winter barley and its modification by breeding.]** Illustr. Landw. Zeit. 1919: 310–311. 1919.—Author reviews the many varieties of two- and four-rowed barleys and indicates aims of breeding; namely, to secure as short-lived a condition as possible without depression of yield, to maintain high yield and power to stand up under heavy nitrogen fertilization, and to produce large full grains with low albuminous content and a minimum chaff. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 126. Dec. 1919.]—*J. P. Kelly.*

1708. Killer, J. **Über die Umzüchtung reiner Linien von Winterweizen in Sommerweizen. [Concerning the changing-over of pure lines of winter wheat into spring wheat.]** Jour. Landw. 67: 59–62. 1919.—With pure lines of winter wheat experiments were conducted to reveal spring wheat possibilities. All Bordeaux wheats serve as either summer or winter cereals. All tested thick-headed wheats with spring sowing send up shoots and show more or less development of heads but decided "Landwinterweizen" do not send up shoots with such sowing. Details of experiments are not given. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 126. Dec. 1919.]—*J. P. Kelly.*

1709. Klatt, Berthold. **Keimdrüsentransplantationen beim Schwammspinner. Ein experimenteller Beitrag zur Frage der Vererbbarkeit erworbener Eigenschaften. [Germ-cell transplantation in Lymantria. An experimental contribution to the question of inheritance of acquired characters.]** Zeitschr. indukt. Abstamm. Vererb. 22: 1–50. Dec., 1919.—A full description is given of the colors and external features of the normal gypsy-moth larva, of a yellow-spotted race supposed to be the product of a cross between *L. japonica* and *L. dispar,* and of a dorsally black-banded strain. Yellow-spotted is probably dominant to normal, but not discontinuous from it, and probably dependent upon multiple factors; black is dominant to non-black (yellow or normal), from which it is discontinuous. Gonads of recessive were transplanted into a dominant, which was mated later with a recessive to ascertain whether period of 8–9 weeks in body of the dominant would affect the offspring, endowing them with any characteristics of the dominant; *e.g.,* ovary of normal transplanted into body of black-banded female after removal of ovaries, mated with non-black, yellow ♂ gave 7♂♂, 7♀♀, "first class" yellow. In more than 400 larvæ from eggs matured in the body of a foster mother, not one showed any modification in the direction of the special characteristics of the foster parent. However, eggs that matured in the body of a female of the black race partook of the superior vigor of that race, shown by rapid growth and large size.—An average of 7–8 per cent of offspring from ♀♀ subject to operation showed loss of one or several median or lateral tubercles in one or more segments, excluding the first and last; but 3 or 4 control broods showed no such loss. Removal of certain tubercles from various segments to see if in the next year the offspring of this individual would lack the corresponding tubercles in four broods gave negative results; but in a fifth, and subsequently three other broods from mothers that had not been operated upon, a similar though less marked defect was seen. It is suggested that a general injury to determinants for the development of tubercles may have occurred, due to difficulties in metabolism during healing, or due, in case of defect in normal control broods, to bacterial disease in the brood of the previous year. There was no evidence of inheritance of mutilations. A discussion of the experiments of Harms, Magnus, Guthrie, Kammerer, and Castle and Phillips is given.—*J. H. Gerould.*

1710. Kottur, G. L. **An improved type of cotton for the southern Maratha country (Bombay Presidency, India).** Agric. Jour. India 14: 155–167. *1 pl.* 1919.—*Gossypium herbaceum* predominates in this region. This variety shows two types—erect and bushy. Test shows superiority in yield of erect type. By unit selection a variety is grown that bears more and has lint of greater value.—*Ganda Singh Cheema.*

1711. KROON, H. M., AND G. M. VAN DER PLANK. **De inschrijving van paarden in de stamboeken. [Description of horses in the pedigree books.]** Genetica 2: 347–364. July, 1920.

1712. KUIPER, K., JR. **Steriele Soortsbastaarden. [Sterile species hybrids.]** Genetica 2: 289–299. *6 fig.* July, 1920.

1713. LEHMANN, E. **Reply to Renner's explanation.** Biol. Zentralbl. 40: 288. June, 1920. [See Bot. Absts. 6, Entry 1112.]

1714. LICHTENSTERN, R. **Bisherige Erfolge der Hodentransplantation beim Menschen. [Results thus far achieved by the transplantation of testes in man.]** Jahreskurse f. ärztliche Fortb. April, 1920. [Cited from review by Benders, Genetica 2: 374–375, July, 1920. See also Bot. Absts. 6, Entry 1634.]

1715. LOTSY, J. P. [Dutch rev. of: BARTSCH, P. **Experiments in the breeding of Cerions.** Dept. Marine Biology, Carnegie Inst. Washington Publ. 282. *55 p., 59 pl.* Washington, 1920. Genetica 2: 366–367. July, 1920.

1716. LOTSY, J. P. [Dutch rev. of: VON WETTSTEIN, FRITZ. **Vererbungserscheinungen und Systematik bei Haplonten und Diplohaplonten im Pflanzenreich. (Genetical phenomena and taxonomy in haplonts and diplohaplonts in the vegetable kingdom.)** Zeitschr. indukt. Abstamm. Vererb. 21: 233–246. Nov., 1919.] Genetica 2: 379–384. July, 1920.

1717. LUNDBORG, H. **Hereditary transmission of genotypical deaf-mutism.** Hereditas 1: 35–40. 1920.—Acquired deaf-mutism may be both of intra- and extra-uterine origin. Consequently "congenital deafness" is not always of an inheritable nature. Acquired deaf-mutism is far more common than inheritable deaf-mutism. The treatise of BERGH is criticized. Author rejects the hypothesis of PLATE that deaf-mutism is a dihybrid character. There is every probability, as the author suggested in 1912, that deaf-mutism is transmitted as a simple Mendelian factor.—*K. V. Ossian Dahlgren.*

1718. LYNCH, R. IRWIN. **Hybrid cestrums.** Gard. Chron. 67: 220. May 1, 1920.—Relates to hybridizing of *Cestrum elegans* (fem.) with *C. Parqui*, with view to secure brightness of flower with hardiness. Male parent stated to be almost absolutely dominant.—*J. Marion Shull.*

1719. MANDEKIC, V. **Nesljectivonje nikih divjstore Koet Kukuruza. [Inheritance of several characters in maize.** [Tcheckish.] Gospodarska smotra 1918: 5–8. 1918.—Length and other ear characteristics for different lines are hereditary. Córrelations of ear length with other traits were observed. Only in pure lines are traits transmitted well, and in selections from groups that are not pure lines transmission is uncertain. [From author's abstract in Zeitschr. Pflanzenzücht. 7: 40–42. June, 1919.]—*J. P. Kelly.*

1720. MANDEKIC, V. **Prilog gojidbi Kukuruza. [Contributions to the breeding of maize.** [Tcheckish.] Gospodarska smotra 1918: 1–4. 1918.—Croatian round maize was bred at Krizevci experimental farms following WILLIAMS's method. Experimentation on effects of self- and cross-pollination gave results similar to those of SHULL and EAST. Lessened vigor on inbreeding is explained as due to increased homozygosity. [From author's abstract in Zeitschr. Pflanzenzücht. 7: 42–43. June, 1919.]—*J. P. Kelly.*

1721. MASUI, KIYOSHI. **The spermatogenesis of domestic mammals. I. The spermatogenesis of the horse (Equus caballus).** Jour. Coll. Agric. Tokyo Imperial Univ. 3: 357–376. *3 pl., 2 fig.* 1919.—Although it is impossible accurately to count the chromosomes of the spermatogonial metaphase, many symmetrical pairs of chromosomes are distinguishable. The resting nucleus of the primary spermatocyte contains a large chromatic nucleolus which persists throughout the growth stages and synapsis. A conspicuous idiosome also exists in the primary spermatocyte. At the division of the primary spermatocyte, which is reduc-

ing and heterotypic, eighteen bivalent chromosomes and one accessory are present. Conjugation is probably parasynaptic. The accessory chromosome passes undivided to one pole, thus yielding two types of secondary spermatocytes. The division of the chromosomes, including the accessory, in secondary spermatocytes is equal and homotypic. Occasionally, incomplete fusion of two adjacent chromosomes occurs, thus reducing the count.—The centrosome behaves much as it does in man, as described by Meves. A chromatoid corpuscle appears during the growth stage, but is probably cast off from the spermatozoön in a mass of cytoplasm. Mitochondria appear during the postsynaptic stage. Most of them mass and give rise to a body resembling the "Nebenkern" in insects. Ultimately this mass comes to occupy the middle part of the spermatozoön.—*M. F. Guyer.*

1722. Masui, Kiyoshi. **The spermatogenesis of domestic mammals. II. The spermatogenesis of cattle (Bos taurus).** Jour. Coll. Agric. Tokyo Imperial Univ. 3: 377–403. *3 pl., 1 fig.* 1919.—Amitotic nuclear divisions (not followed by division of the cell-body) occur more frequently in the spermatogonia of embryos and of very young animals than do mitotic divisions. Such amitosis is regarded as characteristic of degenerating cells which are destined to supply nutriment to the germ cells. The resting nuclei of both penultimate and ultimate spermatogonia are characterized by one large nucleolus and a small chromatin mass. The spermatogonial number of chromosomes is thirty-three. Conjugation is probably telosynaptic. Sixteen bivalent and one univalent (the accessory) chromosomes result. The first spermatocytic division is reducing. The accessory passes undivided to one pole. The second division, which includes the accessory, is a simple equation-division. The chromatin nucleolus, visible through the growth period and the reduction division, is identified as the accessory chromosome.—Incomplete fusion of adjacent chromosomes sometimes occurs in the secondary spermatocytes; so that only nine or ten chromosomes can be counted in such cells. Numerous mitochondrial granules appear during the growth period and thereafter behave similarly to those of the horse. A chromatoid corpuscle is absent or present infrequently. The centrosome of the spermatid divides, and one of the resulting centrosomes comes to lie close to the nucleus—the other a short distance behind it. The axial filament arises from the latter. The idiosome first appears during the growth stage. In the spermatid it seems to have no connection with the centrosome.—*M. F. Guyer.*

1723. Meek, C. F. U. **Chromosome dimensions.** Proc. Roy. Soc. London 91: 157–165. 1920.—Correlation between chromosomes and somatic complexity of animals. Author reviews his own conclusions of 1912 and those of Farmer and Digby, 1914. He also presents additional observations, made without measurements, upon chromosome length, diameter, and total chromatin volume in spermatogonial and spermatocyte complexes of several species of widely separated groups. His final conclusions are that there is no correlation between degree of somatic complexity of animals and their chromosome number, length, or diameter, nor with the total chromatin volume of their complexes.—*C. L. Parmenter.*

1724. Metz, C. W. **Observations on the sterility of mutant hybrids in Drosophila virilis.** Proc. Nation. Acad. Sci. [U. S.] 6: 421–423. July, 1920.—Three sex-linked and probably allelomorphic mutants in *Drosophila virilis*—rugose, glazed, and wax (all affecting the eyes)—have been shown to form a graded series in respect to their morphological characteristics and in respect to fertility, the females of the last two being sterile. In any hybrid involving rugose and either of the others, the first named mutant is dominant as to somatic manifestations; but the females are sterile like the glazed or wax females. Thus the order of dominance of somatic manifestations is the one given, but the reverse is true of fertility. Previously rugose and glazed were spoken of as incompatible, but this was before the sterility of glazed females was noted.—*H. H. Plough.*

1725. Metz, Charles W. **The arrangement of genes in Drosophila virilis.** Proc. Nation. Acad. Sci. [U. S.] 6: 164–166. April, 1920.—In connection with Castle's three-dimensional model of the sex-linked genes of *Drosophila virilis* from data of Metz, certain predictions were made as to the probable location of the genes for frayed, hairy, rugose and glazed; and it was

suggested that these predictions be tested by actual breeding work. This is at present impossible since two of the stocks—frayed and hairy—have been lost, and the hybrids of rugose and glazed are sterile. Certain similar cases are cited which show that Castle's predictions would probably be fulfilled without proving the hypothesis, however; for the results also fit the linear hypothesis. In the one case double cross-overs are not counted, in the other case they are.—*H. H. Plough.*

1726. Meves, Friedrich. **Eine neue Stütze für die Plastosomentheorie der Vererbung. [A new support for the plastosome theory of heredity.]** Anat. Anz. 50: 551–557. *2 fig.* April, 1918.

1727. Mitscherlich, Eilh. Alfred. **Über künstliche Wunderährenbildung. [The artificial production of abnormal heads of cereals.]** Zeitschr. Pflanzenzücht. 7: 101–109. *8 fig.* Dec., 1919.—All rye plants grown in water culture under greenhouse conditions produced an abnormality in the first spike to appear. The remaining spikes were normal. One wheat plant behaved similarly. In a favorable year on well manured soil a rye plant was observed with condensation of spikelets on "spindle end" of all spikes. Seed from this plant gave progeny with normal spikes.—*Fred Griffee.*

1728. Moore, Carl R. **The production of artificial hermaphrodites in mammals.** Science 52: 179–182. Aug. 20, 1920.—A preliminary report of the author's successful transplantation of heterologous gonads into hemicastrated rats.—*H. D. Goodale.*

1729. Mossman, J. P. **Hybridization and raising of seedling orchids.** Florists' Exch. 49: 907, 932. April 17, 1920.—In extended account of personal experience in growing seedling orchids it is stated that *Catleya gigas* crossed with *C. Dowiana* results in yellow veins in throat and intensified color of entire flower; with *C. aurea,* gives veining but not intensified color of sepals and petals. Used with a white flower *C. Dowiana* always puts a trace of rose color through the hybrid. *Catleya aurea* has no influence on a white flower, but does impart its veining and some of its rich color to lip of offspring. Author uses *C. Dowiana* or *C. aurea* as seed-parent in the belief that the character of the female always predominates. Secondary crosses of *Brasso-Catleyas* onto *Catleya* give more color than the primary crosses. Many plants do not survive exhaustion of seed production.—*J. Marion Shull.*

1730. Nakahara, Waro. **Side-to-side versus end-to-end conjugation of chromosomes in relation to crossing-over.** Science 52: 82–84. July 23, 1920.—The stone-fly, *Perla immarginata* Say, is exceptionally fitted for chromosome studies since it has only five pairs of chromosomes, each pair structurally differentiated from all others. In the prophase of the first spermatocyte division, homologous chromosomes are connected to each other telosynaptically in the spireme; later they bend toward each other at the synaptic point and become reunited parasynaptically before metaphase. Contrary to the general belief, telosynapsis does offer an opportunity for interchange between chromosomes (crossing-over); interchange occurs at the late thick stage only. End-to-end conjugation simply restricts the stage in which such an opportunity is offered.—*Bertram G. Smith.*

1731. Nilsson-Ehle, H. **Über Resistenz gegen Heterodera schachtii bei gewissen Gersten-Sorten, ihre Vererbungsweise und Bedeutung für die Praxis. [On resistance to Heterodera schachtii in certain varieties of barley, its method of inheritance and significance for agricultural practice.]** Hereditas 1: 1–34. *4 fig.* 1920.—Unlike other kinds of cereals, there is striking difference between different sorts of barley concerning the resistance against attacks of *Heterodera schachtii.* Some sorts of barley are quite immune. By crossing between an immune sort and a susceptible one, immunity dominates. In $F_2$ nad $F_3$ a segregation takes place that at least in some cases seems to be monohybrid. For the barley itself, the attacks of this nematode are rather unimportant. If, however, oats or wheat are cultivated in a field which has been planted before with infested barley, these cereals suffer in a great degree from the increased number of nematodes in the soil. For this reason it is of a great practical importance to use mmune kinds of barley, thus reducing the number of these worms.

A field with plots of immune and susceptible kinds of barley was the following year planted with a single kind of oats. This plantation developed itself very differently at different spots, which corresponded in a surprising degree to the barley plots of the previous year.—*K. V. Ossian Dahlgren.*

1732. Nonidez, José F. **The meiotic phenomena in the spermatogenesis of Blaps, with special reference to the X-complex.** Jour. Morph. 34: 69–117. *6 pl., 2 diagrams.* June 20, 1920.—In the spermatogonial mitoses of *B. lusitanica* thirty-five chromosomes occur, three of which are remarkably large. During synapsis the three large chromosomes and two of the smaller unite to form the X-complex, while the other chromosomes pair to form fifteen bivalents. Of the large chromosomes, two that appear to be homologous are termed M-chromosomes, while the third corresponds to the accessory or X-chromosome of other forms. In the first maturation mitosis the X-complex undergoes dissociation, four chromosomes—two large and two small—passing to one cell, while the third large chromosome—an M-chromosome—enters the other. The final result is the production of two kinds of spermatozoa; one with nineteen chromosomes, the other with only sixteen. The X-complex seems to represent an intermediate condition between complexes made up exclusively of sex chromosomes and those originated by the linkage of a sex chromosome with a pair of ordinary chromosomes.—*Bertram G. Smith.*

1733. Oberstein, O. **Über das Vorkommen echter Knospenvariationen bei pommerschen und anderen Kartoffelsorten. [Occurrence of true bud-variation in Pomeranian and other varieties of potatoes.]** Kartoffelbau 1919, No. 2 and Deutsch. Landw. Presse 1919: 560–561. *1 pl.* 1919.—Author dissents from views that bud variations are so uncommon as to warrant adverse judgment on a variety when the number of deviating plants per hectare reaches four. He emphasizes frequent occurrence of bud variations, at least in some varieties. Such frequency should be proven before being accepted by seed experts. A Silesian agricultural society passes judgment against such sorts only when number of plants deviating in flower color exceeds 5 per cent. A standard of proof for existence of this variability is described. Illustrative cases observed by author in several varieties are cited. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 135. Dec., 1919.]—*J. P. Kelly.*

1734. Painter, Theophilus S. **The spermatogenesis of Anolis carolinensis.** Anat. Rec. 17: 328. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—The spermatogenesis of reptiles has not received the attention of cytologists heretofore, although the position of the group in the Vertebrate Series and especially the peculiar behavior of the chromosomes as reported for the birds and mammals, make such a study very desirable. The author has been making a comparative study of the spermatogenesis of the lizards common near Austin, Texas. *Anolis carolinensis,* the "American chameleon," has yielded preparations in which the chromosomes show with clear-cut distinctness, and it has been possible to follow practically all of the chromosomes from the spermatogonial divisions to the formation of the mature sperm.—Two points of especial interest have been found.—What appears to be a typical "accessory" or sex-chromosome is found in the first maturation division; it is bipartite in character and goes undivided to one pole of the spindle. In the second maturation division, the sex-chromosome, when present, divides. The sperms are dimorphic as regards the sex-chromosome, half are with, and half are without, this body. There is no trace of degenerating sperms.—The autosome complex of *Anolis* consists of ten large chromosomes and twenty-two smaller bodies. (This condition, a few large chromosomes and a greater number of small chromosomes, seems typical for all the lizards studied.) The autosomes behave normally during maturation. In the first and second spermatocyte divisions, five large and eleven small chromosomes are seen (in addition to the sex-chromosome), and these divide in the usual way. There is no sign of a "double reduction," such as has been reported for birds and some mammals. In this reptile, the chromosomes differ in no respect from what is found in the insects and other invertebrates.—*Theophilus S. Painter.*

1735. Philips, A. G. **Preferential mating of fowls.** Jour. Amer. Assoc. Instr. and Invest. Poultry Husb. 5: 28, 30–32. *6 fig.* 1919.—Continuous observations were made on several flocks, each consisting of one male and 10–28 females. The number of matings per hen per day ranged from 0–5 and was controlled by her. Under some circumstances a single male mated more than 40 times in one day.—*H. D. Goodale.*

1736. Poll, Heinrich. **Mischlingsstudien VIII. Pfaumischlinge, nebst einem Beitrag zur Kern-Erbträger-Lehre. [Hybridization studies VIII. Peafowl hybrids and a comment on the theory of nuclear bearers of heredity.]** Arch. Mikros. Anat. 94: 365–458. *5 fig.* 1920.

1737. Quaglini, Luigi. **Cruzamiento y fecundación artificial de la caña de azúcar. [Cross fertilizing sugar cane.]** Revist. Agric. Com. y Trab. 3: 44–46. *1 fig.* 1920.

1738. Rasmuson, Hans. **Über einige genetische Versuche mit Papaver Rhoeas and Papaver laevigatum. [Some genetical experiments with Papaver Rhoeas and Papaver laevigatum.** Hereditas 1: 107–114. 1920.—By crossing a *Rhoeas*-form having divergent hairs at the peduncle with another one having appressed hairs, a segregation in proportion 1: 1 takes place in $F_1$. The divergent hairs might be dominant, to judge from the species hybrid *Rhoeas* × *dubium*. Yellow latex dominates over white. The segregation in $F_2$ is monohybrid. Green color of leaves dominates over yellow-green. The segregation in $F_2$ is monohybrid. A gene, *S*, produces a black base-spot on the petals; another, *W*, produces a white spot; *S* is epistatic to *W*. If both genes are missing the sepals will be unspotted. *W* affects also the flower color, or is linked with a gene that affects the color.—*K, V. Ossian Dahlgren.*

1739. Rasmusson, J. **Mendelnde Chlorophyllfaktoren bei Allium cepa. [Mendelian chlorophyll-factors in Allium cepa.]** Hereditas 1: 128–134. 1920.—After self-fertilization of a number of flowers of different commercial sorts in several pedigrees, light green, yellow, and white plants were to be found, in relative number which rather well agreed with the Mendelian ones. This is demonstrated by several tables. The complete production of chlorophyll depends on a suite of factors, of which one factor will take effect only if all previous factors in the suite are present. At two points of the suite homomeric factors are acting.—*K. V. Ossian Dahlgren.*

1740. Raum, J. **Ein weiterer Versuch über die Vererbung der Samenfarbe bei Rotklee. [A further study concerning inheritance of seed color in red clover.]** Zeitschr. Pflanzenzücht. 7: 149–155. 1920.—Both violet and yellow are generally found on individual seeds of red clover (*Trifolium pratense*), but occasionally seeds are either wholly violet or yellow. Colors are found in various degrees of saturation. Satisfactory Mendelian explanation would involve theory of multiple factors. Technique necessary for critical study would be very difficult because of flower size and almost invariable and necessary habit of cross-fertilization. Solution of problem is of less economic importance than many others not yet worked out in red clover. Seeds of known color were selected from individual unguarded plants and planted. Seeds from 36 daughter plants derived from 11 mother plants were compared with mother-plant seeds. Author states that daughter seeds were similar to mother-plant seeds, but had a tendency toward increased amount of yellow. Author does not believe, as some suppose, that seed color is correlated with earliness.—*L. R. Waldron.*

1741. Raum, S. **Beiträge zur Praxis der Grassamenerzeugung und des Grassamenbaues. [Contributions to the practice of grass-seed production and grass-seed culture.]** Illustr. Landwirtsch. Zeit. 1920: 25–26. 1920.—Some results have already been secured in breeding of grasses at Weihenstephan. Two forms of fiorin grass differing in times of development were obtained. In meadow panicle, narrow- and broad-leaved forms occurred in population. A series of types was isolated in meadow foxtail grass. In red fescue-grass a form occurred well supplied with runners, and a similar thing was seen in meadow fescue. Golden oats of Bohemian and Tyrolian origin revealed few differences. In French ray-grass, only minute differences were observable, and hereditary maintenance of these was difficult. A similar

difficulty of preservation arose among forms of orchard-grass. Few differences were seen in timothy. Several types of English ray-grass were observed, but little is known of their genetical behavior. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 217. June, 1920.]—*J. P. Kelly.*

1742. Raum, S. **Zur Kenntnis des italienischen Raygrases unter besonderer Berücksichtigung seiner Züchtung.** **[Italian ray-grass with special reference to its breeding.]** Fühlings Landw. 1920: 28–37. 1920.—Great differences were present in this grass as regards length of life. Breeding at Weihenstephan of *Lolium italicum* comprised originally 64 individual selections; two lines were finally retained—namely, No. 36, bearded, and No. 2, rather beardless. The selected lines bloomed near each other, and after three selections there was neither pure beardedness nor pure beardlessness. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 217. June, 1920.]—*J. P. Kelly.*

1743. Renner, Otto. **Mendelsche Spaltung und chemische Gleichgewicht.** **[Mendelian splitting and chemical equilibrium.]** Biol. Zentralbl. 40: 268–277. June, 1920.—See also Bot Absts. 6, Entries 1099, 1713, 1744.

1744. Renner, O. **Zur Richtigstellung.** **[By way of explanation.]** Biol. Zentralbl. 40: 287. June, 1920. See preceding Entry 1743.

1745. Roberts, Herbert F. **The relation of protein content to variety types in American wheat.** Jour. Agric. Sci. 10: 121–134. May, 1920.—General discussion of the relation of protein content in wheat to environmental conditions and to varieties. Mostly a survey of the data from experimenters dealing with this subject. Long period between time of flowering and time of ripening seed favors production of soft kernels with low protein content. Water supply influences protein content to a greater extent than any other edaphic factor. From data submitted, it is shown that the protein content of wheat rises as we pass from moist eastern regions to the drier portions of the western states. Varietal differences do exist which manifest themselves in higher protein content when grown along with other varieties. A variety may have a higher standard deviation of protein content than others, which indicates that this variety is not pure, or that it has a wide range of physiological adaptation. The wheat varieties most widely grown are those which have the widest variability with respect to protein content. In breeding for general purposes, wheat strains should be sought which show the widest variability in protein content; but in breeding for a limited locality, wheat with a maximum protein content and with the least possible variation in protein content should be sought. A bibliography of twelve citations is attached.—*W. E. Bryan.*

1746. Robertson, W. R. B. **The presence of a longitudinal split in chromosomes prior to their union in parasynapsis.** Anat. Rec. 17: 329. Jan., 1920.—Author's abstract of paper read before the American Society of Zoologists, St. Louis, December 30, 1919.—It is usually stated in accounts of the synapsis stages that, following the telophases of the last spermatogonial division, a series of changes takes place which results eventually in the formation of fine single threads (leptotene stage) that pair in the succeeding diplotene. The chromosomes of Tettigidae, of which there are thirteen, exhibit a longitudinal split in each member during the telophase and post-telophase stages previous to parasynapsis. Following the stages in which there are thirteen split chromosomes come those in which the twelve autosomes of the group pair side by side to form six threads, each of which is probably a four-strand structure—a future tetrad. The plan of this presynapsis split in the members of a pair probably coincides to a large extent with one of the planes of division in the succeeding tetrad.—The telophases of somatic mitoses likewise show their chromosomes to be split before entering the so-called resting condition. The split in a telophase chromosome of either a somatic or spermatogonial cell-division probably dates to the resting period previous to the division just being completed.—The presynapsis splitting of each conjugating chromosome may account for the peculiar twisting sometimes visible in the two strands of one of the conjugants as compared with those of the other in long or V-shaped tetrads. The possibility of such independent twisting may have something to do with mechanics of "crossing-over."—*W. R. B. Robertson.*

1747. Roffo, A. H. **Sur le rôle du facteur race dans la transmission du cancer chez le rat. Transformation progressive d'une race non réceptive. [On the rôle of the race factor in the transmission of cancer in the rat. Progressive transformation of a non-receptive race into a receptive one.]** Compt. Rend. Soc. Biol. 83: 968–970. 1920.—Two races of white rats differ in reaction to implants of various tumors which originated in one of them (A). Tumors were of different histological types. Race A showed growths in 95–100 per cent implanted; Race B in 5 per cent; $F_1$ hybrids between these races, 15 per cent; third generation hybrids, 60 per cent. Tumor grown in Race B gave 30 per cent positive. After 9 months serial inoculation gave 80 per cent. Cross between albino and wild (*Mus decumanus*) gave albinos in $F_1$. In next generation albinos, black and white, and black. Evidence for difference in susceptibility correlated with color, was found in small numbers of animals. Tumor from hybrid generation introduced into 10 wild black rats grew slowly in one. After seven passages it grew in 70 per cent (numbers not given). Tumor had then attained virulence and rate of growth equal to control albinos.—*C. C. Little.*

1748. Rosenheim, Otto. **Observations on Anthocyanins. I. The anthocyanins of the young leaves of the grape vine.** Biochem. Jour. 14: 178–188. *Fig. 1.* 1920.

1749. Saunders, E. R. **Heredity.** Sci. Monthly 1: 436–445. 1920.—Extracts from an address at the Cardiff Meeting of the British A. A. S.—History of attempts to analyze heredity begins with Galton and Pearson.—The effect of results due to two or more factors are suspected when ratios run high.—We can not infer from the genetic analysis of one type that the factorial relations are the same for the corresponding character in another. No sharp line of distinction can be drawn between the behavior of varietal and specific features.—*L. Pace.*

1750. Schiemann, E. [German rev. of: White, O. E. **Inheritance studies in Pisum. I.** Amer. Nat. 50: 530–547. 1916. Idem. **II. The present state of knowledge of heredity and variation in peas.** Proc. Amer. Phil. Soc. 56: 487–588. 1917; Idem. **III. The inheritance of height in peas.** Mem. Torrey Bot. Club 17: 316–322. June 10, 1918; [See Bot. Absts. 1, Entry 250.] Idem. **IV. Interrelation of the genetic factors of Pisum.** Jour. Agric. Res. 11: 167–190. 1917.] Zeitschr. indukt. Asbtamm. Vererb. 24: 98–101. Aug., 1920.

1751. Schleip. [German rev. of: Herbst, K. **Beiträge zur Entwicklungsphysiologie der Färbung und Zeichnung der Tiere. 1. Der Einfluss gelber, weisser und schwarzer Umgebung auf die Zeichnung von Salamandra maculosa. (Contribution to the physiology of development of the color and color-pattern animals. 1. The influence of yellow and black surroundings on the color pattern of Salamandra maculosa.)** Abhandl. Heidelberger Akad. Wiss. Math.-Naturwiss. 1919.] Zeitschr. indukt. Abstamm. Vererb. 24: 101–103. Aug., 1920.

1752. Schubart, P. **Blutauffrischung in der Zuckerrübensamenzucht. [Freshening the blood in sugar-beet breeding.]** Zeitschr. Pflanzenzücht. 6: 209–215. Dec., 1918.

1753. Schultz, Walter. **Bemerkung zur Arbeit von Knud Sand über experimentellen Hermaphroditismus. [Comment on the work of Knud Sand on experimental hermaphroditism.]** Pflügers Arch. f. d. ges. Physiol. 179: 217–218. 1920.

1754. Scott, Will. **A sex intergrade pig, which resembles a free-martin.** Anat. Rec. 17: 323. Jan., 1920.—Author's abstract of paper read before American Society of Zoologists, St. Louis, December 30, 1919.—This pig is full term and has the external genitalia of a female. In addition, a scrotum is developed. Internally a vagina and uterus are formed, but the gonad has migrated and degenerated. The position of the ducts has been modified correlative to that of the gonad.—*Will Scott.*

1755. Siemens, Hermann Werner. **Über einige immer wiederkehrende Missverständnisse der Entwicklungslehre. [On several always-recurring misunderstandings in genetics.]** Med. Klin. 16: 12–16. 1920.

1756. SIEMENS. [German rev. of: GASSUL, R. **Eine durch Generationen prävalierende symmetrische Fingerkontratur. (A symmetrical contraction of the fingers prevailing through generations.)** Deutsch. med. Wochenschr. 44: 1197–1198. *2 fig.* 1918. [See Bot. Absts. 5, Entry 367.] IDEM. **Nachtrag zu meiner Mitteilung über "Eine durch Generationen prävalierende symmetrische Fingerkontratur." (Supplement to my contribution on a symmetrical contraction of the fingers prevailing through generations.)** Deutsch. med. Wochenschr. 44: 1450. 1918.] Zeitschr. indukt. Abstamm. Vererb. 24: 103–104. Aug., 1920.

1757. SIEMENS. [German rev. of: ZWEIG, LUDWIG. **Über einen Fall von Epidermolysis bullosa hereditaria. (On a case of epidermolysis bullosa hereditaria.)** Arch. Dermatologie u. Syphilis 120: 1–6. 19.] Zeitschr. indukt. Abstamm. Vererb. 24: 104. Aug., 1920.

1758. SIRKS, M. J. **Hereditas, genetiskt arkiv utgivet av mendelska sällskapet i Lund. (Hereditas, genetic archive published by the Mendelian Society of Lund.)** Vol. 1, Häft 1. Berlingska Boktryckeriet: Lund, 1920.] Genetica 2: 373. July, 1920.—Notice and review of the first number of new Swedish genetical journal, Hereditas.—*G. H. Shull.*

1759. SIRKS, M. J. **Prae-Mendelistische erfelijkheidstheorieën. [Pre-Mendelian theories of heredity.]** Genetica 2: 323–346. *3 fig.* July, 1920.

1760. SIRKS, M. J. [Dutch rev. of: ÅKERMAN, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116–127. *6 fig.* 1920.] Genetica 2: 365–366. July, 1920. [See Bot. Absts. 6, Entry 1565.]

1761. SIRKS, M. J. [Dutch rev. of: EAST, EDWARD M., AND DONALD F. JONES. **Inbreeding and outbreeding.** 14 × 21 *cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919. (See Bot. Absts. 4, Entry 571; 5, Entries 337, 1495 and 1607.)] Genetica 2: 370–373. July, 1920.

1762. SIRKS, M. J. [Dutch rev. of: HERIBERT-NILSSON, N. **Zuwachsgeschwindigkeit der pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana. (Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.)** Hereditas 1: 41–67. *1 fig.* 1920.] Genetica 2: 375–377. July, 1920.

1763. SIRKS, M. J. [Dutch rev. of: RASMUSON, HANS. **Über einige genetische versuche mit Papaver Rhoeas und Papaver laevigatum. (Some genetical experiments with Papaver rhoeas and Papaver laevigatum.)** Hereditas 1: 107–114. 1920.] Genetics 2: 377–378. July, 1920.

1764. SIRKS, M. J. [Dutch rev. of: TEDIN, HANS. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 pl., 2 fig.* 1920.] Genetica 2: 378–379. July, 1920.

1765. SMITH, BERTRAM G. **The individuality of the germ-nuclei during the cleavage of the egg of Cryptobranchus alleghenlensis.** Anat. Rec. 17: 323. Jan., 1920.—Author's abstract of paper read before American Society of Zoologists, St. Louis, December 30, 1919.—In the fertilization of the egg of *Cryptobranchus alleghenlensis* the germ-nuclei do not fuse, and in the first cleavage mitosis each gives rise to a separate group of chromosomes, whose descendants pass separately to the daughter-nuclei. During the ensuing resting stage each germ-nucleus is represented by a structurally distinct vesicle. The separateness of the germ-nuclei is thus maintained throughout the entire nuclear cycle. Throughout early cleavage the nuclear divisions are of the same duplex type, and the resting nuclei are always distinctly double. The genetic continuity of each half of the double nucleus has been clearly traced to an advanced cleavage stage. During late cleavage and in the early gastrula the nuclei are still typically double; but certain irregularities which tend to disguise the double structure occur with increasing frequency, and the segregation of the maternal and paternal chromatin cannot always be demonstrated. The hypothesis of individuality of the germ-nuclei as applied to those species in which there is a mingling of maternal and paternal chromosomes is discussed, and supported by considerations regarding the persistent individuality of the chromosomes. [See also Bot. Absts. 4, Entry 771.]—*Bertram G. Smith.*

1766. STEHLIK, W. **Bekämpfung des Wurzelbrandes bei der Zuckerrübe durch ihre Züchtung. [Control of sugar beet rootrot by breeding.]** Öst-Ung. Zeitschr. Zuckerind. u. Landw. 47: 1–10. 1918.

1767. STEINACH, EUGEN, AND PAUL KAMMERER. **Klima und Mannbarkeit. [Climate and sexual maturity.]** Anz. Akad. Wiss. Wien 56: 252–257. 1919.

1768. STEINACH, E., AND P. KAMMERER. **Klima und Mannbarkeit. [Climate and sexual maturity.]** Archiv Entwicklungsmech. 46: 391–458. *2 fig.* 1920.

1769. STEINACH, E. **Verjüngung durch experimentelle Neubelebung der alternden pubertätsdrüse. [Rejuvenation through experimental revitalization of the senile sex glands.]** Archiv Entwicklungsmech. Org. 46: 557–619. *9 pl., 7 fig.* July, 1920.

1770. STORK, HARVEY, E. **Studies in the genus Taraxacum.** Bull. Torrey Bot. Club 47: 199–210. May, 1920.—*Taraxacum confertum* and *T. platycarpum* are sexual forms with a diploid chromosome number of 16. *T. vulgare*, *T. erythrospermum*, and *T. albidum* are ooapogamous forms with about twice as many chromosomes as the sexual forms. Considerable variability is found in the ooapogamous forms.—*Karl Sax.*

1771. STRASSER, HANS. **Fragen der Entwicklungsmechanik. Die Vererbung erworbener Eigenschaften. [Questions of developmental mechanics. Inheritance of acquired characters.]** *158 p.* Ernst Bircher: Bern and Leipzig. 1920.

1772. STUART, C. P. COHEN. **Die Züchtung der Teepflanze. [Breeding of the tea plant.]** Zeitschr. Pflanzenzücht. 7: 157–204. *8 fig.* June, 1920.

1773. STUDY, E. **Eine lamarckistische Kritik des Darwinismus. [A Lamarckistic critique of Darwinism.]** Zeitschr. indukt. Abstamm. Vererb. 24: 33–70. Aug., 1920.

1774. ŠVESTKA, VLADISLAV. **Eine seltene Haarbeschaffenheit (hellfarbig, stark gekräuselt) in Böhmen. [A rare hair character (light colored, strongly crinkled).]** Česká dermatol. Jg. 1: 171–174. 1920.—Describes a 12-year-old girl from region of Pilsen, studied at the clinic for skin-diseases at the Technical University at Prag. Hair of propositus was 5–6 cm. long of color No. 25 of E. FISCHER's color table, and crinkled as in typical negro hair. No known negro elements occur in the ancestry, and no other negroid characters are observable in the propositus. Hair is of typical oval form in cross-section and visibly deficient in pigmentation. Eye-color is dark blue. Author raises question whether this abnormality accords with GRIMALDI's theory of the introduction of negro elements to Europe at the time of the Flood. [From abstract by MATOUSCHEK in Bericht. u. d. gesamt. Physiol. 2: 22. Aug., 1920.]—*G. H. Shull.*

1775. TAYLER, NOEL. **A case of hermaphroditism in a lizard, Lacerta viridis.** Proc. Zool. Soc. London 1918: 223–230. *3 fig.* Mar., 1919.—The hermaphrodite possessed a complete male reproductive system and, in addition, (1) "spherical ovarian appendages" attached to the dorso-lateral border of the testes by well-defined stalks, and (2) oviducts "developed for about a third of their lengths," each having a well developed funnel. Sectioned testicular tissue was normal. Sections through the stalked outgrowths showed ovarian tissue with many large ova and smaller ova, the youngest being in the stalks near the testes. Sections through kidneys revealed in one kidney an embedded mass of almost fully grown ova. Author figures general arrangement of reproductive system; a section of ovarian tissue; and a section of kidney, showing contained mass of ova.—*A. M. Banta.*

1776. TEDIN, HANS. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 colored pl., 2 fig.* 1920.—Purple color is conditioned by three factors. The presumptive factor for rose adopted from previous investigations is not a simple factor, but is composed of two factors. One of these, *A*, gives light purple, and this one is also the real fundamental

factor for the flower color in *Pisum arvense*. A second factor, *B*, together with *A*, gives rose. A third factor, *C*, acting together with *A*, gives violet, while all the three together give purple. *B* and *C* in the absence of *A* are without effect and the flowers are white. No difference has been observed between homozygotes and heterozygotes with respect to flower color. The common white-flowered varieties of peas may usually if not always be *aaBBCC*. The hilum of the violet-flowered individuals ($A\binom{A}{a}bb\ C\binom{C}{c}$) have an abnormal structure, and lack the tracheal tissue. The conduction of nourishment to the ovules is consequently made more difficult, and the plants show a very poor development of the seeds. The abnormal structure of the hilum is directly connected with the factor-combination, *AC* without *B*. Tabulations of the results of the crosses occupy 19 pages.—*K. V. Ossian Dahlgren.*

1777. Thomson, Arthur. **The maturation of the human ovum.** Jour. Anat. 53: 172–208. *3 pl., 18 fig.* April, 1919.—The diameter of the human ovum, including the zona pellucida, is about 0.11 mm. The ovum is ovoid, not spherical. The zona pellucida sometimes shows faint concentric lamination, the characteristic radial striation probably occurring only in the later stages of maturation. A distinct vitelline membrane seems to line its inner surface. At the time of the extrusion of the polar bodies, both of which are apparently expelled before the oöcyte leaves the Graafian follicle, what appears to be a perivitelline space is in evidence. —The nucleus ranged in size from 0.020 × 0.017 mm. to 0.030 × 0.024 mm.; a membrane may or may not be present. Within the nucleus are chromatin granules which may be single, paired, in masses, or arranged in threads. The karyoplasm is more finely granular and paler than the cytoplasm. The latter contains vacuoles, often with a granule within, as well as isolated granules. There is evidence of a centrosome.—*M. F. Guyer.*

1778. Urban, J. **Über die Grösse der Stecklinge. [On the size of cuttings.]** Zeitschr. Zuckerindust. Böhmen 42: 521–526. 1918.—See Bot. Absts. 6, Entry 1612.

1779. van der Plank, G. M. **Kruising van Yersey met Zwartbont vee. [Cross of Jersey cattle with black spotted.]** Genetica 2: 300. July, 1920.

1780. van der Wolk, P. C. **Onderzoekingen betreffedne den Cocospalm. [Investigations concerning the coconut palm.]** Cultura 1918: 1–34. 1918.—See Bot. Absts. 6, Entry 1613.

1781. von Rümker, K. **42 Sortenanbauversuche im Verwaltungsgebiete des Oberfehlshabers Ost. [Forty-two variety culture tests in Oberfehlshabers Ost.]** *72 p.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1614.

1782. von Rümker, K. **Die Staatliche Organisation der Sortenprüfung. [State organization of variety testing.]** *32 p.* Paul Parey: Berlin, 1918.—See Bot. Absts. 6, Entry 1615.

1783. von Ryx, Georg. **Methoden einer exakten Prüfung des Fortschrittes bei der Zuckerrübenzucht. Paritäts- und doppelte Standard-methode. [Methods of exactly testing the advancement in sugar beet breeding. Parity and double standard method.]** Zeitschr. Pflanzenzücht. 7: 227–237. June, 1920.

1784. von Ubisch, G. **Anwendung der Vererbungsgesetze auf die Kulturpflanzen. [Application of the laws of heredity to cultivated plants.]** Naturwissenschaften 8: 293–300. 1920.

1785. von Wettstein, Fritz. [German rev. of: van Wisselingh, C. **Über Variabilität und Erblichkeit. (Variation and heredity.)** Zeitschr. indukt. Abstamm. Vererb. 22: 65–126. *10 fig.* Jan., 1920. (See Bot. Absts. 4, Entry 3532.)] Zeitschr. Bot. 12: 462–465. 1920.

1786. Wagner, M. **Abbauerscheinungen am Hopfen und Organisation in der Hopfenzüchtung. [Phenomena in unimproved hops and organization in hop-breeding.]** Deutsch. Landw. Presse 1919: 788. 1919.—After experience in a certain hop region ("Neutomischler" region) author urged an organization for hop-breeding, directed from a central office and

working locally for production of uniform stands through selection of proper plants and dissemination of cuttings of them. Author has started such selection in above-mentioned region before war. [From anonymous review in Zeitschr. Pflanzenzücht. 7: 220. June, 1920.] —*J. P. Kelly.*

1787. Waldron, J. W., A. Gartley, C. R. Hemenway, J. N. S. Williams, G. P. Wilcox, T. H. Petrie, and H. P. Agee. **Report of the committee in charge of the Experiment Station.** Rept. Exp. Sta. Hawaiian Sugar Planters Assoc. 1919. *49 p.* 1920.—See Bot. Absts. 6, Entry 901.

1788. Winge, Ö. **Über die Vererbung der Haarfarbe der Pferde. [Heredity of hair color in the horse.]** Zeitschr. indukt. Abstamm. Vererb. 24: 1–32. Aug., 1920.

1789. Wodsedalek, J. E. **Studies on the cells of cattle with special reference to spermatogenesis, oögonia, and sex-determination.** Biol. Bull. 38: 290–316. *5 pl.* May, 1920.—Material for the study of the germ cells of males were obtained from the testes of seven adult bulls, one five-month fetus, and six smaller fetuses; for the cells of females, from the ovaries of four heifers and four adult cows. Somatic cells were studied in slides from various parts of a number of embryos and small fetuses of each sex.—In the male, 37 chromosomes (36 ordinary and 1 accessory) appear in spermatogonial divisions. The accessory is heart-shaped and therefore easily identified in this and succeeding divisions. It is identified with the large nucleolus of resting stages. In the primary spermatocytes, 18 bivalent chromosomes and 1 accessory appear in metaphase. The accessory passes undivided to one pole; so that half of the secondary spermatocytes receive 19, and half, 18 single chromosomes. A second doubling of chromosomes occurs; so that the equatorial plate of the secondary spermatocytes reveals 9 and 10 chromosomes (9 plus the accessory), respectively. The accessory, when present, and each of the doubled chromosomes divide. But the division is not reductional in nature; hence half of the spermatids really receive the equivalent of 18 single chromosomes, and half receive 19. Occasionally the 18 (or 19) chromosomes can be distinguished after division, but usually the chromosomes pass to the resting stage before complete separation occurs. Measurements of six hundred heads show that there are two classes of spermatozoa. Those of the larger type presumably contain the sex-chromosome.—The oögonia resemble the last spermatogonial cells closely in appearance although they are larger and possess two distinct accessory chromosomes. It is inferred that the reduced number of chromosomes in each mature ovum is 19, inasmuch as 38 appear in oögonial divisions. Male somatic cells contain 37 chromosomes, and female somatic cells, 38 chromosomes. The sex chromosomes in somatic cells—one in the male, two in the female—were as distinguishable as in the germ cells.—*M. F. Guyer.*

1790. Wohanka and Company. **28. Jahresbericht der Rübensamenzüchtungen von Wohanka & Comp. [28th annual report of the beet breeding of Wohanka & Co.]** *95 p., 5 fig.* Wohanka & Co.: Prag, 1918.—See Bot. Absts. 6, Entry 1624.

1791. Zade. **Die Versuche über Klee- und Gräserzüchtungen des landwirtschaftlichen Instituts Jena. [Experiments in clover and grass breeding of the Jena Agricultural Institute.]** ahrb. Deutsch. Landwirtsch. Ges. 1918: 139–150. 1918.—See Bot. Absts. 6, Entry 1625.

1792. Ziegler, H. E. **Zuchtwahlversuche an Ratten. [Selection experiments on rats.]** Festschr. z. Feier. 100-jähr. Best. Kgl. Württ. Landw. Hochschule Hohenheim. 1918: 385–399. 1918.—The author was able to modify the amount of white in the coat of Irish rats by selection. He explains his results by the multiple factor hypothesis.—*Sewall Wright.*

1793. Zweig, Ludwig. **Über einen Fall von Epidermolysis bullosa hereditaria. [On a case of epidermolysis bullosa hereditaria.]** Arch. Dermatologie u. Syphilus 120: 1–6. 19—.

# HORTICULTURE

J. H. Gourley, *Editor*

## FRUITS AND GENERAL HORTICULTURE

1794. Ardouin-Dumazet. **L'Horticulture des régions dévastées. (Horticulture in the devastated regions.)** Rev. Hortic. [Paris] 92: 61–63. 1920.—A brief statement is given of the general conditions which prevailed in the vicinity of the various centers of horticultural importance, together with an estimate of the damage done by war. The industry is recovering rapidly, since the local demands for the foods produced is as great as formerly, and the difficulty and expense of transportation does not permit of securing fruits or vegetables from the southern districts.—*E. J. Kraus.*

1795. Aspinwall, B. **Planting and cultivating the loganberry.** Better Fruit $14^{10}$: 12. 1920.—A brief practical account of planting and cultivating the loganberry. The author is one of the leading loganberry growers of the Northwest.—*A. E. Murneek.*

1796. Batchelor, L. B., and H. S. Reed. **Winter injury or die-back of the walnut.** Better Fruit $14^{11}$: 9–10, 32. 1920.—Reprint of California Agric. Exp. Sta. Circ. 216.

1797. Blair, R. E. **The work of the Yuma reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 75. *77 p., 32 fig.* 1920.—See Bot. Absts. 6, Entry 1406.

1798. Brown, W. Robertson. **Notes on the progress of the European olive at Peshawar.** Agric. Jour. India 15: 150–153. *2 fig.* 1920.

1799. Caryl, R. E. **The bearing habit of lemons.** California Citrograph 5: 294. *Fig. 1–2.* 1920.—A comparison of the bearing habits of the Eureka and Lisbon, the two chief commercial varieties of California. Graphs show comparative pickings for each month in the year at Santa Paula in the cool, moist coast district and at Corona in the hot, dry, interior district. The highest percentage of the Lisbon crop in the Corona district comes in the month of February, while in the Santa Paula district it is one month later. The proportion of midsummer pickings is greater for both varieties near the coast, though there is a greater amount of variation in the Eureka than in the Lisbon.—*J. E. Coit.*

1800. Chasset, L. **Determination des fruits (Poires). I. Considerations generales. [Classification of fruits (pears). I. Generalities.** Rev. Hortic. [Paris] 92: 106–107. 1920.—Pomological keys have proven unsatisfactory. Most of them are based upon the use to which the fruit is destined, whether for (1) the table, (2) cooking, or (3) cider. These characteristics, however, represent a final estimate of the fruit as a whole, and can not be taken as points upon which to construct keys. Nor is it sufficient to attempt classification on the basis of group names such as Doyennés, Bergamotes, Colmars, and the like, since these may contain varieties very different in character. The most satisfactory primary characters are those of shape. (To be continued.)—*E. J. Kraus.*

1801. Chasset, L. **Determination des fruits (Poires). II. La clef pomologique Chasset. [Classification of fruits (pears). II. The Chasset pomological key.]** Rev. Hortic. [Paris] 92: 126–128. *Fig. 33–48.* 1920.—A continuation of an article by the same author (Rev. Hortic. [Paris] 92: 106–107. June, 1920).—Three families are created on the basis of the relation of the height of the fruit to its breadth. These are in turn divided into groups according to the general form of the fruit; each of these forms is designated by a type variety. After a fruit has been placed in its proper family, it is next classified according to its season of maturity; then according to the color of its skin at the time of picking, not at maturity. On the basis of the length and method of insertion of the peduncle, three classes are made. Each of these classes is further divided; first, on the basis of the color of the flesh, and then on its flavor. Farther differentiation of two or more varieties not separated by the above characters is accomplished through reference to descriptive notes.—*E. J. Kraus.*

1802. CLAUSTON, C. I. E. **The possibilities of agriculture in India within the next twenty years.** Agric. Jour. India 15: 239–247. 1920. A discussion—*J. J. Skinner.*

1803. DAHL, A. L. **Methods of utilizing California wine grapes.** Better Fruit $14^{11}$: 11–12. 1920.—Because of national prohibition and the consequent closing of wineries, wine grapes must be diverted into other channels of usefulness. A method has been perfected by which the natural flavor and aroma of the fruit may be preserved in making grape syrup. Vineyardists are working at present upon the problem of preserving the fresh juice of grapes without fermentation. Details of experiments to preserve the fresh juice by means of sulphurous acid are given. A large part of the present crop of wine grapes will be dried. Other ways of utilizing the grapes may be found in making of vinegar and saving the pomace for stock feed or for the manufacture of sugar, cream of tartar, and oil.—*A. E. Murneek.*

1804. DARROW, G. M. **Raspberry culture—red, black, purple. In all phases.** Better Fruit $14^{11}$: 3–4, 35–38. 1920.—A verbatim reprint from U. S. Dept. Agric. Farmer's Bull. 887. —*A. E. Murneek.*

1805. DARROW, G. M. **The currant and gooseberry and how to grow them.** Better Fruit $14^{9}$: 8–10, 38. 1920.—A verbatim extract from U. S. Dept. Agric. Farmer's Bull. 1024.

1806. ENFER, V. **Stérilité des arbres fruitiers. [Sterility of fruit trees.]** Rev. Hortic. [Paris] 92: 46. 1920.—Sterility may be due to an abundance of fertilizers which induce excessive vegetative growth; fungous diseases, such as *Fusicladium pyrinum*; insects, such as aphids and beetles; late spring frosts; rains, which wash away the pollen and prevent the activity of bees; heavy winds; and excessive blooming or production of fruits. All these factors should be considered, and such measures as may seem practical utilized in combating them.—*E. J. Kraus.*

1807. ENFER, V. **Sur la Passe-Crassane. [Concerning the Passe-Crassane pear.]** Rev. Hortic. [Paris] 92: 88–89. 1920.—This excellent variety should be planted more widely. Though the fruit tends to be rough on very rapidly growing trees, when the variety is grafted on the quince the fruits are large, smooth and of good quality. It forms especially congenial union with Beurré Diel, Curé, and Beurré d'Hardenpont. Special care is required in pruning. —*E. J. Kraus.*

1808. ENFER, V. **Treilles gelées. [Frozen grape-vines.]** Rev. Hortic. [Paris] 92: 67–68. 1920.—When vines are frozen, due to late frosts following a period of weather which has advanced the season's growth, not only may the crop of that season be ruined, but that of the following year may be endangered. The eye or bud of the grape possesses at its base another bud, or sometimes two, which may be forced into growth if the principal one is destroyed. The shoots arising from these second buds, when proper care is taken, will develop into strong canes, and will frequently produce bunches of fruits. In the event of a freeze, all of the frozen buds should be cut away immediately, both to encourage the production of new shoots from the second buds, and to prevent the decomposition of the frozen tissues near such buds. Later the unfruitful or weaker shoots should be removed entirely, and those which remain should be pinched back before the end of the growing season in order to encourage maturation and lignification.—*E. J. Kraus.*

1809. ETTER, ALBERT E. **The origin of the Ettersburg strawberry.** Better Fruit $14^{6}$: 14. Dec., 1919.—The "Peruvian Beach" strawberry was pollinated with a blossom from one of the third generation Sharpless × Parry plants. Among the eleven seedlings growing from seed of this cross was the Ettersburg.—*A. E. Murneek.*

1810. FLAHAULT, C. **L'Horticulture en Alsace. [Horticulture in Alsace.]** Rev. Hortic. [Paris] 92: 26–28. 1920.—The alluvial soil of Alsace, and the general climatic conditions, are well adapted to the growing of plants of many kinds, both native and exotic. This has resulted in the development of a large nursery industry and of a broad, general amateur and

professional interest. Formerly many professional gardeners were trained here. A plea is made for the establishment at Strasbourg of a definitely organized institution for training native gardeners, particularly those capable of speaking French and the Alsatian dialect.—*E. J. Kraus.*

1811. Flippance, F. **Betel.** Gardens' Bull. Straits Settlements 2: 294–300. *3 pl.* 1920.—A description of the Betel nut palm (*Areca Catechu*, Linn.) and the Betel Leaf (*Piper Betle*, Linn.) with notes on their uses and extent of cultivation in Malaya.—*T. F. Chipp.*

1812. Garnier, M. **Plantes nouvelles ou peu connues. (New or little-known plants.)** Rev. Hortic. [Paris] 92: 55–56. *Fig. 13–14.* 1920.—Brief descriptions of nine varieties of vegetables, including the bean, beet, cabbage, tomato, melon, peas and cardoon, and eight varieties of flowers, such as *Cyclamen*, *Myosotis*, carnation, *Petunia*, *Begonia*, *Verbena*, and China aster, are given.—*E. J. Kraus.*

1813. Gould, H. P. **Some useful and timely hints on peach growing.** Better Fruit $14^{11}$: 8–9. 1920.—A verbatim reprint from U. S. Dept. Agric. Farmers Bull. 632.

1814. Guion, A. **Chauffage de serres par l'électricité. [Heating greenhouses by electricity.]** Rev. Hortic. [Paris] 92: 64. 1920.—It is feasible to use electricity for this purpose only when it can be obtained cheaply. Heating may be effected by the use of radiators, of which there are many forms available, or by tubes beneath the benches and connected with an electrically heated supply tank or boiler. One of these devices could be installed in each house or group of houses. It would be possible to heat them by means of wood or charcoal-burning stoves in case the current should fail temporarily.—*E. J. Kraus.*

1815. Hammond, A. A. **Small fruit culture in Victoria.** Jour. Dept. Agric. Victoria 18: 351–358. *4 pl.* 1920.—A description of the cultivation of the loganberry and of conditions suitable for its growth is given.—*J. J. Skinner.*

1816. Hansen, Dan. **The work of the Huntley reclamation project experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 86. *32 p., 5 fig.* 1920.—See Bot. Absts. 6, Entry 1413.

1817. Headley, F. B. **The work in 1918 of the Newlands (formerly the Truckee-Carson) reclamation project experiment farm.** U. S. Dept. Agric. Dept. Circ. 80. *18 p., 1 fig.* 1920.—See Bot. Absts. 6, Entry 1417.

1818. Hess, N. **Experiences in plant hybridization.** Proc. Amer. Soc. Hortic. Sci. 16: 52–60. (1919) 1920.—Attention is drawn to the fact that of all the fields pertaining to evolution, the one that seems to be the least cultivated is hybridism. Few artificially produced hybrids are referred to in citing examples, but most of them are natural hybrids.—Hybridism has been employed more especially in floriculture, and this has been for the purpose of obtaining monstrous novelties. Many of the most popular ornamental flowers are due to hybridization.—The author has been carrying on rather extensive experiments in hybridization with two genera; namely, *Rubus* and *Quercus*. Detailed results, obtained from crossing blackberries and dewberries are given. Data are presented on third generation results in crossing, in several cases.—The results of several years' work in crossing different oaks (*Quercus*) are given. From the work with oaks the author states that he has learned that the various individuals of a species vary widely in their affinity for foreign pollen. He has come to believe that to be successful in hybridization, it is necessary to search out by trial the individuals having the proper affinity for the pollen to be applied. For this purpose, seedlings would naturally be preferred to plants produced vegetatively.—*E. C. Auchter.*

1819. Howard, W. L. **Fruit growing and dairying: A desirable farming combination.** Proc. Soc. Promotion Agric. Sci. 39: 135–139. 1919.—Fruit growing in California has become highly specialized. Whole districts devoted almost exclusively to the production of one kind of fruit for 35 or 40 years are finding the soil is becoming unfertile for want of humus.

The growing of winter green manure crops has not entirely overcome this difficulty. Better success has been achieved by growing field beans in the orchard or a strip of alfalfa between the rows. The author proposes a combination fruit and dairy farm as the best means of maintaining the soil fertility in California orchards. This farm should preferably be operated by two men—one a fruit grower and one a dairyman. This plan besides furnishing manure for the orchard would better distribute the labor.—*H. N. Vinall.*

1820. HOWARD, W. L. **The value of the different roots as stock.** Better Fruit $14^{10}$: 19–20. 1920.—A brief discussion is given of the value of apricot root stock for prunes and the French and Japanese root stocks for pears.—*A. E. Murneek.*

1821. JOUIN, E. **L'Horticulture in Lorraine désannexée. [Horticulture in disannexed Lorraine.]** Rev. Hortic. [Paris] 92: 44–45. 1920.—Previous to 1870 a broad professional and amateur interest was manifested in horticulture. This has declined appreciably since then, though recently there seems to be a new and awakened interest. There is but one important public garden, located at Metz. The hills on the left shore of the Moselle, the Saar basin and the Palatinate afford a considerable tree and small fruit industry. There are many small greenhouses which do a local business in easily grown plants. There is an extensive vegetable growing industry at Metz, and on both banks of the Moselle. The nursery business has always been the most extensive branch of horticulture in Lorraine. At various places good specimens of various exotic trees may be found.—*E. J. Kraus.*

1822. JUDD, C. S. **The Makiki Nursery.** Hawaiian Forester and Agric. 17: 124–126. 1920.

1823. KRAEMER, HENRY. **Michigan—an important source of raw vegetable products.** Michigan Acad. Sci. Ann. Rept. 21: 167–199. 1919.—See Bot. Absts. 6, Entry 1980.

1824. LAMPROY, E. **Lo rajeunissement des pêchers en plein vent. [Rejuvenation of standard peach trees.]** Rev. Hortic. [Paris] 92: 32–34. *Figs. 7–8.* 1920—The method of rejuvenation consists in a heavy heading-back, even of the very large branches, close to a lateral; so that the process is at the same time also one of thinning out. Larger yields of better fruit were secured from the pruned trees than from those which were left unpruned and had been neglected for some time. The cuts should be made with a fine-toothed saw, trimmed with a sharp knife, and covered with mastic. Attention is directed to the fact that this same method of pruning peach trees was advocated in the middle of the nineteenth century by Naudin et Decaisne in their "Manuel de l'amateur des jardins" 4: 423.—*E. J. Kraus.*

1825. LANDRY, R. **Le transport des primeurs par avion. [Transporting early crops by aeroplane.]** Rev. Hortic. [Paris] 92: 83. *Fig. 20.* 1920.—A shipment of forced strawberries of the variety DOCTOR MORÉRE was sent by aeroplane on March 18, 1920, by MR. DE LA CELLE, from Saint-Laurent-du-Var to Paris.—*E. J. Kraus.*

1826. LETTEER, C. R. **The work of the San Antonio experiment farm in 1918.** U. S. Dept. Agric. Dept. Circ. 73. *38 p., 4 fig.* 1920.—See Bot. Absts. 6, Entry 1423.

1827. LEWIS, C. I. **Pear culture at home and abroad.** Better Fruit $14^{10}$: 23–24. 1920.—A popular article on pear growing, with particular reference to the northwestern United States.—*A. E. Murneek.*

1828. NOREN, C. A. **A practical demonstration of fruit thinning.** Better Fruit $14^{12}$: 15–16. 1920.—Four sets of comparisons were made of well thinned and poorly thinned orchards. In every case fruit from poorly thinned orchards was smaller in size and lacked the necessary color to grade it as "extra fancy." The writer believes also that proper thinning lessens the strain on fruiting spurs and diminishes the habit of alternate bearing.—*A. E. Murneek.*

1829. Parmentier, Paul. **Les irrigations et les arrosages en Syrie et en Palestine. [Irrigation in Syria and Palestine.]** Compt. Rend. Acad. Sci. Paris **169**: 391–393. 1919.—A discussion of the climate and the methods of irrigation of various crops in Syria and Palestine. The methods of irrigation employed are inefficient because of the excessive amount of water required; the high humidity produced in groves of fruit trees, which greatly increases the growth of parasitic fungi; and the effect of the fungi on the quality of vegetables.—V. *H. Young.*

1830. Ruffer, Sir Arnold. **Food in Egypt.** Mem. Inst. Egypt. 1. *86 p.* 1919.

1831. Russell, G. A. **A machine for trimming camphor trees.** U. S. Dept. Agric. Dept. Circ. 78. *8 p., 4 fig.* 1920.—See Bot. Absts. 6, Entry 1468.

1832. Sundquist, R. **Means of accomplishing orchard tillage.** Better Fruit $14^{12}$: 25–26. 1920.—In respect to clean tillage of orchards in irrigated sections three essentials are emphasized: (1) the soil must be worked early in the spring; (2) it must be left in a pulverized condition; and (3) tillage must be continued throughout the early part of summer. The value of the tractor for tillage purposes is discussed in detail.—*A. E. Murneek.*

1833. Taylor, R. H. **The growing and culture of almonds in California.** Better Fruit $14^{10}$: 3–6, 40. 1920.—An extract from "The Almond in California." California Agric. Exp. Sta. Bull. 297. 1918.

1834. Thornber, W. S. **Commercial fertilizers for the orchard and the garden.** Better Fruit $14^{9}$: 7, 39. 1920.—The writer discusses in a general way the necessity and value of the use of commercial, particularly nitrogenous, fertilizers in the orchards of the northwestern United States. The present economic necessity of increasing crops is emphasized.—*A. E. Murneek.*

1835. True, Rodney H. [Rev. of: Hedrick, U. P. **Manual of American grape-growing.** MacMillan Co.: New York, 1919.] Bot. Gaz. **68**: 390–391. 1919.

1836. West, F. L., and N. E. Edlefsen. **Temperature which will damage or kill fruit buds.** Better Fruit $14^{10}$: 13–14. 1920.—An almost verbatim extract Utah Agric. Exp. Sta. Bull. 151. 1917.

1837. Zimmerman, G. **Planting and care of prune orchard up to bearing age.** Better Fruit $14^{11}$: 5, 33–34. 1920.—Based on long practical experience advice is given by a successful prune grower as to the selection of site, planting, and cultural management of a prune orchard up to bearing age of the trees.—*A. E. Murneek.*

## FLORICULTURE AND ORNAMENTAL HORTICULTURE

1838. Anonymous. **Groupement des meilleures variétés de chrysanthèmes. [Grouping of the best varieties of chrysanthemums.]** Jour. Soc. Nation. Hortic. France **21**: 39–51. Jan., 1920.—This is a grouping of varieties of chrysanthemums by a committee of French horticulturists, giving lists of the best varieties of the different types for various purposes and uses.—*H. C. Thompson.*

1839. Anonymous. **The fruiting of the Ginkgo at Kew.** Kew Bull. Misc. Inf. [London] **1920**: 47–48. *1 fig.* 1920.—First record of the fruiting of Ginkgo in England.—*E. Mead Wilcox.*

1840. Anonymous. **Concours de roses nouvelles de Bagatelle 1920. (Concours of new roses at Bagatelle 1920.)** Rev. Hortic. [Paris] **92**: 125–126. 1920.—A gold medal was awarded to Pernet-Ducher for the new, vigorous, floriferous, pure chrome-yellow variety Souvenir de Claudius Pernet, and to A. Dickson for the new hybrid tea, Frances Gaunt, which is free

flowering, semidouble, and of a salmon-yellow color. Certificates were granted for the following varieties: Benedicte Seguin (Pernet-Ducher)—resembling a hybrid-tea rather than Pernetiana, golden yellow; Président Parmentier (Sauvageot)—hybrid-tea, apricot rose, seedling of Colonel Leclerc × Le Progrès; La France Victorieuse (Hay Rosery)—hybrid-tea, tender rose, deeper at center; Comtesse de Cassagne (Guillot)—hybrid-tea, ivory yellow, tinged salmon at center; Mermaid (Wm. Paul)—hybrid of *Rosa braceata* and an unknown variety of tea, single, pale yellow, foliage brilliant and persistent in winter, valuable as a source of new varieties. Several other varieties of interest are listed.—*E. J. Kraus.*

1841. Anonymous. **List of seeds of hardy herbaceous plants and of trees and shrubs.** Kew Bull. Misc. Inf. [London] Appendix 1920: 1–25. 1920.

1842. Anonymous. **A garden flora: Nymans.** Kew Bull. Misc. Inf. [London] 1919: 240. *10 figs.* 1919.—A list of plants grown in the Messel collection at Nymans in the south of England with notes on the behaviour of the more remarkable species.—*E. Mead Wilcox.*

1843. Bean, W. J. **Garden notes on new or rare trees and shrubs.** Kew Bull. Misc. Inf. [London] 1920: 119–124. 1920.

1844. Blin, H. **Sur la résistance du vitrage des serres. [The resistance of green house glass.]** Rev. Hortic. [Paris] 92: 113–114. 1920.—Brief comparative table is given on the relative breaking strength of two types of glass, together with another table showing the relation between weight and thickness of glasses having unit surface area.—*E. J. Kraus.*

1845. Bois, D. **Le laeliocattleya Firmini.** Rev. Hortic. [Paris] 92: 30. *1 pl. (colored).* 1920. —This species is named for Firmin Lambeau, of Brussels, and was produced by A. A. Peeters & Sons, from a cross made in 1904 between *Laeliocattleya Ceres* (*Cattleya Mossiae* × *Laeliocattleya Phoeba*), a yellow variety, and *Cattleya Dowiana aurea.* Two forms differing in color from the original are also known. *L. Firmini ardens*, shown at London in 1913, has the floral divisions, copper red instead of apricot yellow, whereas *L. Firmini Massange*, named for Leon Massange by Peeters in 1913, is reddish saffron. The several varieties are the same in form of flower and in character of the lip.—*E. J. Kraus.*

1846. Chenault, L. **Hamamelis vernalis Sargent.** Rev. Hortic. [Paris] 92: 47. *Fig. 11.* 1920.—A brief description of this species from the viewpoint of using it as an ornamental is given. It is recommended because of its hardiness and the abundance of fragrant blossoms it produces very early in the spring. It might even be utilized as a pot-plant for house decoration, provided some leafy plant were grown with it to produce the foliage effect.—*E. J. Kraus.*

1847. Clarkson, Edward Hale. **The story of a fern garden. I.**—Amer. Fern. Jour. 10: 53–57. 1920.

1848. Eldridge, A. G. **Plants for gardens farthest north.** Garden Mag. 31: 245–248. *4 fig.* 1920.—Discusses herbaceous woody and ornamental plants for various environments in the northern United States and Canada.—*H. C. Thompson.*

1849. Garnier, M. **Plantes nouvelles pour 1920. [New plants for 1920.]** Rev. Hortic. [Paris] 92: 34–35. *Fig. 9–10.* 1920.—Brief descriptive notes are given on thirteen herbaceous ornamentals and pot-plants of wide variety, an early turnip, an early pea, and a hardy, productive potato.—*E. J. Kraus.*

1850. Guillaumin, A. **Le Colocasia. À propos de l'introduction récent du vrai C. indica. [Concerning the recent introduction of the true Colocasia indica.]** Rev. Hortic. [Paris] 92: 104–106. *Fig. 26–27.* 1920.—A short descriptive note of this species, to which many names have been given, its means of separation from the closely allied forms, and a short key to the several species of the genus, are given.—*E. J. Kraus.*

1851. Krelage, E. **À propos de la classification des Tulipes. [Concerning the classification of tulips.]** Rev. Hortic. [Paris] 92: 30–31. 1920.—Corrections of an article by Mottet, S. (Les tulipes Darwin. Rev. Hortic. [Paris] 92: 10–11. Jan., 1920.) Figure 4 of the colored plate does not represent the variety Goldflake, which is red striped with yellow, but rather some variety belonging to the class known as "bizarres." Instead of representing several varieties of Darwin tulips, as the legend indicates, the plate actually shows clearly the differences between the Darwins and other late tulips. The varieties Rev. Ewbank and Europe, with flowers more or less square and enlarged at the base are typical of the Darwins, to which Margaret also belongs, but it is not so well figured. Inglescombe Yellow, with elongated flower, belongs to the Cottage class. The yellow color is never found among Darwin tulips. A report based upon a study in 1914 and 1915 of varieties grown under more than 1500 names in the gardens of the Royal Horticultural Society of London was issued in 1917. It is the work of a joint committee from England and Holland, and contains many illustrations as well as a system of classification of the various varieties.—*E. J. Kraus.*

1852. Lesourd, F. **Campanula pyraversi Cayeux.** Rev. Hortic. [Paris] 92: 124. *1 plate (colored), fig. 32.* 1920.—This form was obtained by Mr. F. Cayeux as a hybrid between *Campanula pyramidalis* L. and *C. versicolor* Sibth and Smith, whence the name. It is self-fertile, and likewise fertile with either of the parent species. The hybrid possesses characters derived from both parents, but in the long petioles of the radicle leaves and the well developed pedicels of the flowers it resembles neither. Because of its desirable tints of blue color, darker at the center, long blooming season, and adaptability for growing in beds, in masses, or in pots, it should be generally cultivated.—*E. J. Kraus.*

1853. Lesourd, F. **Contribution a l'histoire de la pyramide. [On the history of the pyramidal tree.]** Rev. Hortic. [Paris] 92: 81–82. 1920.—Though incapable of exact determination, it appears that the pyramidal type of tree originated in Lorraine, near Metz, at an early date and spread from there eastward and westward, reaching the region of Paris about the middle of the eighteenth century or a little later. Several direct literature citations are given.—*E. J. Kraus.*

1854. Letacq, A. **Notes sur la culture du Camellia dans l'ouest de la France. [On the culture of Camellia in western France.]** Rev. Hortic. [Paris] 92: 120–121. 1920.—It is possible to grow *Camellia japonica* L. throughout an extensive territory in France. The plants must be protected in the more northern ranges, but are perfectly hardy in the south. It is especially to be noted that silicious soils are the most favorable to good development, whereas in calcareous soil the plants soon turn yellow and die.—*E. J. Kraus.*

1855. Lillie, R. I. **Flowers.** Hawaiian Forester and Agric. 17: 6–9. 1920.—Discusses factors involved in successful flower growing, grouping them under four heads: (1) seasons; (2) seeds; (3) sowing; and (4) soil. Practical for amateurs.—*Stanley Coulter.*

1856. Loizeau, A. **Jardin en campagne. [A country garden.]** Rev. Hortic. [Paris] 92: 51–53. *Fig. 12.* 1920.—The discussion deals with the general arrangement of country gardens, and the location of specimen plants, groupings, and borders. A selected list of materials and proposed plan are submitted.—*E. J. Kraus.*

1857. Morel, F. **Les bénéfices d'une calamité: Laurier de Serbie et Pyracantha pauciflora. [The good fortunes out of a calamity. Serbian laurel and Pyrocantha pauciflora.]** Rev. Hortic. [Paris] 92: 80–81. 1920.—The Serbian laurel, *Laurocerasus schipkaensis*, proved entirely hardy during the severe winter of 1917. A number of the hybrid seedlings of this species and the Caucasian laurel also proved perfectly hardy. These forms were very variable in character, some of them being worthy of propagation. *Pyracantha pauciflora*, while entirely hardy, normally produces few flowers or fruits and is, to that extent, lacking in decorative qualities. A number of seedlings of it, however, have not only proven perfectly hardy, but also highly productive of both flowers and fruits. These should prove of great value as ornamentals.—*E. J. Kraus.*

1858. MOREL, F. **Les bénéfices d'une calamité—Buxus haleppica, Evodia, Actinidia chinensis. [The good fortunes out of a calamity, Buxus haleppica, Evodia, Actinidia chinensis]** Rev. Hortic. [Paris] 92: 100–102. 1920.—A continuation of a similar article by the same author in Rev. Hortic. [Paris] 92: 80–81. May, 1920.—Among a number of seedlings of a box-plant presumed to be *Buxus haleppica*, all of which possessed broad leaves, larger than those of any of the varieties of the common box, one at least has proven entirely hardy. This is a desirable ornamental and may furnish valuable genetic material. Specimens of *Evodia*, large, rapidly growing Asiatic trees with ash-like foliage and semi-tropical appearance, and also those of *Actinidia chinensis*, an ornamental vine, were uninjured by the severe cold weather of 1917.—*E. J. Kraus.*

1859. MOTTET, S. **Cedrus libani brevifolia.** Rev. Hortic. [Paris] 92: 84–86. *Fig. 21.* 1920.—During the past two centuries of cultivation, *Cedrus libani* has given rise to the following varieties: *glauca, nana, nana pyramidata, pendula, denudata, stricta, candelabrum, fusiformis, microcarpa*, and *decidua*. The variety *brevifolia* was discovered in 1879, on the Island of Cyprus. It is a distinct form, readily distinguished by the short, deep green leaves. It grows more slowly and gracefully than the type species, and deserved to be widely planted, especially in parks and gardens where space is limited.—*E, J. Kraus.*

1860. MOTTET, S. **Le lilium regale en Amerique. [Lilium regale in America.]** Rev. Hortic. [Paris] 92: 66–67. *1 pl.* 1920.—This fine representative of the longiflorum group has proven entirely hardy in Massachusetts. It is readily propagated from seeds and adapted to forcing as well as out-door culture. It was introduced by E. H. WILSON from the valley of the Min, in the north-west of Setchuen, China. A hybrid between *Lilium regale* and *Lilium sulfureum*, itself belonging to the longiflorum group and having large, long flowers of a beautiful canary color, is said to be taller than the former, bulbiliferous like the latter, and productive of large, odorous flowers.—*E. J. Kraus.*

1861. MOTTET, S. **Nouveaux Narcisses grandiflores. [New large flowered Narcissi.[** Rev. Hortic. [Paris] 92: 47–49. *1 pl. (colored).* 1920.—Several of the newer varieties are considered worthy of special mention. These include the following: *Narcissus Pseudo-Narcissus* —Glory of Leiden, Madame de Graaf; *N. incomparabilis*—Barri Albatros, Vesuvius, Magdaline de Graaf, Princess Mary, Beatrice Leedsi; *N. poeticus*,—Virgile. The colored plate illustrates Weardale Perfection, Cleopatra, Will Scarlet, Gloria Mundi, White Lady, and Mrs. Langtry.—*E. J. Kraus.*

1862. PETIT, A. **Arrosage par immersion des plantes en pots. [Watering pot plants by immersion.]** Rev. Hortic. [Paris] 92: 68. 1920.—The watering of potted plants by immersing the pots in a tank has the advantages of complete wetting without displacing any of the soil, of conserving the soil nitrates, and of a great saving of time and hand labor. The pots should not stand more than half their depth in water. As soon as the soil has become thoroughly moistened the tanks should be drained. For the greatest success, it is essential that all such conditions as age, size and type of plant, kind and amount of soil, as well as form and dimension of the pots should be uniform. Since this is difficult to secure, it is necessary frequently to regroup the plants in the several tanks.—*E. J. Kraus.*

1863. PINELLE, J. **Berberis subcaulialata C. K. Schneider.** Rev. Hortic. [Paris] 92: 28–30. *Fig. 5–6.* 1920.—This species was found by MAURICE DE VILMORIN arising from some seeds coming from Thibet, in 1904. It is thoroughly hardy and adapted to a wide variety of soils. The foliage is persistent up to December or January. The fruit is red. It is suited for planting in large masses. Propagation may be effected either vegetatively or by sowing stratified seeds in March or April.—*E. J. Kraus.*

1864. PINELLE, J. **Lonicera Maacki Ruprecht.** Rev. Hortic. [Paris] 92: 122–123. *Fig. 30–31.* 1920.—This shrubby species has long been known and cultivated in the botanic garden at Moscow. The flowers are conspicuous, produced abundantly, white changing to yellow, followed by red fruits which are ornamental in the autumn. It is entirely hardy and deserving of being widely planted.—*E. J. Kraus.*

1865. Pinelle, J. **Pterocarya stenoptera.** Rev. Hortic. [Paris] 92: 91–92. *Fig. 22.* 1920.—This thoroughly hardy species is vigorous, indifferent as to soil, and deserves to be more generally planted. It has proven entirely satisfactory as a street tree in Paris. Propagation is most readily effected by seeds, though shoots are produced freely fron the root; cuttings are also employed.—*E. J. Kraus.*

1866. Poupion, J. **Les Catasetum, leur culture. [Growing Catasetums.]** Rev. Hortic. [Paris] 92: 98–100. *Fig. 23–25.* 1920.—Species and varieties of this genus are not generally seen in the collection of either commercial or amateur orchid growers. Usually the plants degenerate and die soon after importation or at least flower but rarely. This condition can be corrected through cultural methods. The plants should have complete rest without watering from November to March, in a cool house. They may then be completely potted anew, brought into a temperature of about 18° to 23°C., and watered sparingly after growth begins by dipping the pots into water the temperature of the greenhouse. When the flowers appear in April or May, the watering must be further decreased, and special care exercised to prevent either the direct rays of the sun or drafts of air from striking the new growths which reach maturity about November, at which time the rest period begins. This method of treatment has been employed with entire success with eleven species and varieties of this genus.—*E. J. Kraus.*

1867. Poupion, J. **L'Inobulbon munificum Kranzlin.** Rev. Hortic. [Paris] 92: 64–66. *Fig. 15–16.* 1920.—The separation of *Dendrobium muricatum* Finet and *D. muricatum munificum* Finet on the basis that the former produces a single flower cluster while the latter produces several is untenable, since both in culture and in the native state the same plant may produce single or multiple clusters, depending upon its vigor. Kranzlin considered this form generically distinct from *Dendrobium,* and made two species on the basis of the single or multiple character of the flower cluster; the former he called *Inobulbon muricatum,* the latter *Inobulbon munificum.* These two species are one and the same. A detailed description is given. The species requires a warm house throughout the year, and offers interesting material for hybridization.—*E. J. Kraus.*

1868. Proschowsky, A. R. **L'Aralia à papier sur la Côte d'Azur. [The paper Aralia at Côte d'Azur.]** Rev. Hortic. [Paris] 92: 103. 1920.—*Tetrapanax papyrifer* C. Koch has proven an excellent, partially hardy ornamental. Though it flowers profusely, no fertile seeds are produced. It propagates itself very readily, however, by means of sprouts from the roots, to the extent that frequently a group of mass effect is produced about a single mother plant. The pith is said to be used in China and Japan for the manufacture of a superior grade of paper.—*E. J. Kraus.*

1869. Proschowsky, A. R. **Les Conifères dans les terres calcaires sur la Côte-d'Azur. [Conifers in calcareous soils at Côte-d'Azur.]** Rev. Hortic. [Paris] 92: 75. 1920.—In addition to the Aleppo pine, which is found abundantly as a native in the district mentioned, the four conifers most resistant to calcareous soils are *Pinus excelsa* Wall; *Pinus canariensis* C. Sm; *Pinus Laricio* Poir; and *Pinus radiata* D. Don. Among the other resistant conifers the following are mentioned: *Picea Morinda* Link; *Cedrus Deodara* Loud; *Cupressus sempervirens* L; *Cupressus lusitanica* Mill; *Cupressus guadalapensis* S. Wals; *Cupressus macrocarpa* Hartw; *Cryptomeria japonica* Don.; *Araucaria excelsa* R. Br.; *Araucaria Bidwilli* Hook; *Thuyopsis dolabrata* Sieb. and Zucc; species of *Podocarpus, Cephalotaxus* and *Juniperus,* and others.—*E. J. Kraus.*

1870. Ridsdale, P. S. **The Memorial Trees of the United States.** Garden Mag. 30: 177–180. *2 fig.* 1920.—A discussion of the movement on foot all over the country to plant trees as memorials, giving methods of planting and caring for different kinds of trees.—*H. C. Thompson.*

1871. TURBAT, E. **Les belles roses nouvelles ou récentes.** [Good roses, new or recent.] Rev. Hortic. [Paris] 92: 31–32. 1920.—The present article deals with varieties of special merit belonging to the class Pernetiana, created by PERNET-DUCHER, which have been introduced since 1910. *Constance* (Pernet-Ducher), 1915—good for massing, but elongated, orange yellow, striped carmine; flower cadmium yellow passing to golden yellow; more hardy than *Rayon d'Or* (Pernet-Ducher) 1913. Juliet (W. Paul) 1910,—extremely vigorous; flower full, perfumed, rich rose red deepening on opening, reverse of petals old gold; much in demand as a cut flower. Louise-Catherine Breslau (Pernet-Ducher), 1912—vigorous, flower large, full, shrimp red tinted copper red orange, reverse of petals chrome yellow; good for massing or for cutting. Madame Edouard Herriot, (Pernet-Ducher), 1913—very floriferous, coral red shaded yellow and saffron red, passing to shrimp red; incomparable for massing and excellent for cutting. Marie-Adelaide Grande Duchesse de Luxembourg (Soupert and Notting), 1912—flower large, full, deep orange, bud elongated, good for massing or cutting. Mistress Wemyss Quin (A. Dickson and Sons), 1914—flower medium, intense chrome yellow; excellent for massing. Expression of judgment is reserved on the following varieties: *President Bouche*, *Raymond*, *Mrs. Farmer*, *Severine* (Pernet-Ducher), and *Golden Emblem* (MacGredy). (To be continued.)—*E. J. Kraus.*

1872. TURBAT, E. **Les belles roses du groupe hybrides de thés distribuées depuis 1910. [Good hybrid-tea roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 49–50. 1920.—A continuation of a similar article (Rev. Hortic. [Paris] 92: 31–32. 1920.).—The following varieties are included and briefly described: Admiral Ward (Pernet-Ducher), 1915—good grower, very floriferous, large full flower, carmine shading to flame red and velvety purple. for massing and cutting. André Messimy (P. Guillot), 1914—medium grower, floriferous, brilliant ochreous orange, shaded carmine. Augustus Hartmann (B. R. Cant), 1914—good grower, floriferous, very large flowers, geranium red shaded orange. Colette Martinet (Pernet-Ducher), 1915—extremely floriferous, flowers full, old gold shaded yellow orange, for massing and cutting. Duchess of Normandy (Ph. Le Cornu), 1912—delicate salmon red touched with yellow, for massing. Duchess of Sutherland (A. Dickson), 1912—extremely vigorous, half trailing, flowers the color of the sweet briar but shaded citron yellow, white at base, good for the center of mass plantings and possibly as a cut flower. Edward Mawley (McGredy), 1911—flowers full, very large, rich velvety crimson, for massing. General Superior Arnold Janssen (Leenders), 1911—good grower, flowers full, large, deep carmine, for massing and cutting. Gorgeous (Hugh Dickson), 1915—large flower, well formed, deep orange yellow shaded copper yellow and veined with copper red, adapted to all purposes. George Dickson (A. Dickson), 1912—very vigorous, flowers very large, blackish velvety crimson scarlet. Hadley (A. N. Pierson), 1914—flowers full, deep velvety crimson, good for forcing as a cut flower. Hoosier Beauty (Dorner), 1915—very floriferous, flowers full, sparkling crimson, borne on erect, firm stems, excellent for forcing as cut flower or growing in the open air in France. Lieutenant Chauré (Pernet-Ducher), 1910—vigorous, large, full flower, red carmine shaded garnet, for massing or cutting. Lucien Chauré (Soupert and Notting), 1913—vigorous, flesh colored rose, for cutting or massing. Madame Caristie Martel (Pernet-Ducher), 1916—very vigorous, very large flowers, full, pure sulfur yellow, deeper at the center. Madame Charles Lutaud (Pernet-Ducher), 1912—large flower, chrome yellow lightly shaded with rosy saffron. Madame Edmond Rostand (Pernet-Ducher), 1912—flower elongated, full, clear rose shaded salmon and of a reddish orange yellow at center. Madame Jules Bouché (J. Croibier), 1910—vigorous, flower elongated, full, salmon white, for massing and cutting. Madame Lucien Baltet (Pernet-Ducher), 1911—flowers large, full, clear rose shaded yellow, for massing. Mrs. Charles Russel (Waban Conservatories), 1913—vigorous, erect, flower large, full, rose carmine, for massing, cutting, and growing in pots. Madame Marcel Delanney (Leenders), 1915—vigorous, floriferous, flowers large, full, soft, tender, shaded rose, stems long and strong; highly commendable. Mayflower (E. G. Hill)—erect, flowers large, white, petals margined with rose. (To be continued.)—*E. J. Kraus.*

1873. TURBAT, E. **Les belles roses du groupe hybrides de thés distribueés depuis 1910. [Good hybrid-tea roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 69–70. 1920.—A

continuation of similar article (Rev. Hortic. [Paris] 92: 49–50. 1920.). The following varieties are considered as most worthy: Melody (A. Dickson), 1911—vigorous, compact, flowers of good size, deep saffron yellow, good for massing or cutting. Mrs. Edward Powell (Bernaix), 1910—large flowers, uniform velvety carmine red, very good for massing. Mrs. Moorfield Storey (E. G. Hill), 1915—vigorous and erect, flowers enormous, tender rose, very good for massing and cutting. Ophelia (Wm. Paul), 1912—flower of perfect form, full, flesh colored salmon shaded with rose, widely grown in United States and England as a cut flower, but little known in France. Primrose (Soupert and Notting), 1912—fairly vigorous, flowers large, melon yellow shaded apricot, good for massing or cutting. Souvenir de E. Guillard (Chambard), 1912—large flowers, rosy yellow shaded coppery carmine. Souvenir de J. Passinge (Chambard), 1912—flowers large, coppery saffron lightly shaded carmine and deep yellow. Souvenir de Gustav Prat (Perner-Ducher), 1910—very large flowers, sulfur yellow. Sunburst (Pernet-Ducher), 1912—well known variety, adapted to all uses, massing, cutting or growing in pots. Senorita Carmen Sert (Pernet-Ducher), 1916—very vigorous, foliage bronze green, flower large, indian yellow shaded pale carmine rose, the edges of the petals striped with bright carmine. Two single varieties are mentioned: Princess Mary (E. J. Hicks), 1915—the largest single flower, crimson scarlet, anthers yellow, buds long and pointed. Red Letter Day (A. Dickson), 1914—flowers large, sometimes with two rows of petals, shining crimson scarlet, producing a good decorative effect. Judgment is reserved on varieties introduced since 1916. The descriptions of all the foregoing varieties are based on plants growing in central France.—*E. J. Kraus.*

1874. Turbat, E. **Les belles Roses nouvelles distribueés depuis 1910. [Good, new roses distributed since 1910.]** Rev. Hortic. [Paris] 92: 86–88. 1920.—A continuation of the general article on this subject (Rev. Hortic. [Paris] 92: 31–32; 49–50; 69–70. 1920.)—Two hybrid perpetual varieties are mentioned: Candeur Lyonnaise (Croibier, 1913)—seedlings of Reine des Nieges, large, double flower, pure white sometimes touched with sulfur yellow; and Louise Crett6 (Chambard), 1915)—very vigorous, floriferous, large flowers, white tinted cream at center. The following varieties, all of which forms are adapted for massing in beds and for pot culture, belong to the Polyanthus or dwarf multiflora perpetual group. Andree Lenoble (E. Turbat and Co., 1916)—very vigorous, large clusters, double flowers, brilliant rose or clear red, very early; Baby Lyon Rose (E. Turbat and Co., 1916)—erect growth, double flowers, coral red; Bordure (Barbier and Co., 1911) very dwarf, flowers double, pure carmine, good for a border; George Elger (E. Turbat and Co., 1912)—erect growth, flower coppery gold passing to clear yellow, forces well; Ellen Poulsen (Poulsen, 1911)—vigorous, flowers in large clusters, double, deep shining rose, the best variety for pot culture and forcing; Jeanny Soupert (Soupert and Notting, 1912)—vigorous, large clusters of flowers, flesh-colored white; one of the best; Mme. Jules Gouchault (E. Turbat and Co., 1913)—large erect panicles, buds vermilion red shaded orange, passing to bright rose and then clear rose when open; Marie Brissonnet (E. Turbat and Co., 1913)—dwarf, large corymbs of medium sized flowers, flesh-colored rose bordered carmine; Maman Turbat (E. Turbat and Co., 1911)—very vigorous and hardy, flowers soft China rose, shaded clear peach pink and reddish yellow, the backs of the petals saffron and tender flesh white, excellent effect; Margenta (Barbier and Co., 1916)—dwarf, flowers semi-double, violet red passing to reddish violet; Merveille des Rouges (Dubreuil, 1911)—dwarf, flowers full, intense crimson with a white center; Renoncule (Barbier and Co., 1913)—dwarf, flowers shaped like a buttercup, brilliant salmon rose, very different from any other; Triomphe Orléanais (J. Peauger, 1912)—vigorous, flower deep scarlet red not tending to violet; Yvonne Rabier (E. Turbat and Co., 1910)—hardy, flowers white tinged clear sulfur yellow, of its class the best white for massing.—*E. J. Kraus.*

1875. Van den Heede, A. **Les plantes vivaces et rustiques: Les Gentianes. [Perennial, hardy plants: the gentians.]** Rev. Hortic. [Paris] 92: 84. 1920.—The various species of gentians, of which there are a large number, are particularly valuable when masses of blue color are desired. The red or yellow flowered forms seem less attractive. *Gentiana acaulis* L. is one of the best and most widely disseminated species.—*E. J. Kraus.*

1876. WILSON, E. H. **The cedars of Lebanon.** Garden Mag. 30: 178–183. *4 fig.* 1919.—An article discussing the cedar of Lebanon (*Cedrus libani*), giving its distribution in Asia and Africa. Mention is made of celebrated trees of this species in England and in the United States.—*H. C. Thompson.*

1877. WILSON, E. H. **The romance of our trees. II, The Ginko.** Garden Mag. 30: 144–148. *7 fig.* 1919.—History, description, and general discussion of this tree; its introduction and planting in Europe and America.—*H. C. Thompson.*

1878. WOLLEY-DOD, A. H. **A revised arrangement of British roses.** Jour. Botany Suppl. 58: 1–20. 1920.

## VEGETABLE CULTURE

1879. ENFER, V. **Semis de choux d'hiver. [Seeding winter cabbage.]** Rev. Hortic. [Paris] 92: 90–91. 1920.—In addition to a list of the varieties generally grown, general directions for sowing the seed and handling the young plants are given.—*E. J. Kraus.*

1880. ENFER, V. **Carrottes printanières. [Spring carrots.]** Rev. Hortic. [Paris] 92: 73–74. *Fig. 17–19.* 1920.—General directions on selection of varieties, preparation of soils, and time and method of planting.—*E. J. Kraus.*

1881. ENFER, V. **Le Céleri-rave. [Celeriac.]** Rev. Hortic. [Paris] 92: 38–39. 1920.—General cultural directions and the most profitable varieties are noted.—*E. J. Kraus.*

1882. ENFER, V. **Navets pour l'hiver. [Turnips for winter.]** Rev. Hortic. [Paris] 92: 129–130. 1920.—General directions are given regarding preparation of soils, selection of varieties, time of planting, harvesting, and storage.—*E. J. Kraus.*

1883. LACAITA, C. C. **The "Jerusalem artichoke." (Helianthus tuberosus.)** Kew Bull. Misc. Inf. [London] 1919: 321–339. 1919.—An historical account of the botany, culture, and common names assigned to *Helianthus tuberosus.*—*E. Mead Wilcox.*

1884. LESOURD, F. **Sur l'histoire du Topinambour. [The history of the Jerusalem artichoke.]** Rev. Hortic. [Paris] 92: 37–38. 1920.—The opinion of ASA GRAY that the native habitat of this species ranges through Canada to Saskatchewan, south to Arkansas and central Georgia, has been confirmed, in preference to the idea that it is a native of Peru or Brazil. Though first mentioned in botanical literature in 1616, it was at that time well known in the markets of France under the name "Topinambour," this term having been derived from the name of a tribe of Brazilian natives. It was brought from Canada to France, and thence introduced into England and Italy. Very few varieties are known. The following have been named and introduced: *yellow* (1808), *potato* (1895), and *spindle* (1916), by VILMORIN in France; *white* (1891), by SUTTON in England. COCKERELL has added *nebrascensis*, *alexandri*, *purpurellus*, and *purpureus.*—*E. J. Kraus.*

1885. MEUNISSIER, E. **La Cantaloup de Vaucluse. [The Vaucluse Cantaloup.]** Rev. Hortic. [Paris] 92: 102–103. 1920.—This melon is found on the Parisian markets from midsummer to mid-September. Though of small size and medium quality, it is grown in great abundance in the region of Cavaillon. The more specialized methods of growing it in that district are detailed. Artichokes are planted in August to follow the melon crop. These are harvested the following May and are in turn succeeded by a crop of beans.—*E. J. Kraus.*

1886. MEUNISSIER, E. **Choux-fleurs et Brocoli dans la Crau de Chateaurenard. [Cauliflower and brocoli in "la Crau de Chateaurenard."]** Rev. Hortic. [Paris] 92: 70–71. 1920.—In this district where irrigation is employed, these vegetables are grown in great abundance and sent to many markets. Brocoli is a late or winter cauliflower, and the two are not precisely distinguishable except that they mature at different seasons. General directions on the care of the young plants, transplanting, and cultivation are given. The ground is

occupied by the earlier varieties for 4 to 6 months, and by the later varieties for 7 or 8 months. To have the ground in use throughout the year, a crop of early potatoes may alternate with the cauliflower and a crop of beans or lettuce with the brocoli.—*E. J. Kraus.*

1887. Truax, Hartley E. **United States grades for northern-grown onions.** U. S. Dept. Agric. Dept. Circ. 95: 3–4. 1920.

1888. Truax, Hartley E. **United States grades for Bermuda onions recommended by the United States Department of Agriculture.** U. S. Dept. Agric. Dept. Circ. 97: 2–4. 1920.

1889. Wittmack, L. **Gemüsesamenbau.** **[Vegetable seed culture.]** Landw. Hefte. 41 and 43: 7–96. *30 fig.* 1919.—An extended account of the production of seeds, especially in Germany, of each of the garden vegetables. The work is divided into two parts. The first treats of general matters such as statistics, soils, fertilizers, seed quality, fructification, tillage, harvesting, cleaning and seed improvement. The second part is devoted to the growing of seed of each kind of vegetable.—*C. V. Piper.*

## HORTICULTURE—PRODUCTS

1890. Anonymous. [Rev. of: Hargreaves, W. A. **Cream of tartar manufacture in South Australia.** Bull. Dept. Chem. South Australia 3. *112 p.* 1916.] New Zealand Jour. Sci. and Tech. 1: 126. 1918.—Average wine production of the state for 5 years from 1911 was 3,000,000 gallons a year, and total possible production of cream of tartar 64 to 126 tons.—*C. S. Gager.*

1891. Anonymous. **The Oil Palm.** Kew Bull. Misc. Inf. [London] 1919: 238. 1919.—A brief note on *Elaeis guineensis nigrescens poissonii.*—*E. Mead Wilcox.*

1892. Bartlett, H. H. **The manufacture of sugar from Arenga saccharifera in Asahan, on the east coast of Sumatra.** Michigan Acad. Sci. Ann. Rept. 21: 155–165. *Pl. 3–6.* 1919.—There is given a history of the natives, their customs, and the agricultural condition of the land. Then follows the history of the sugar palm, *Arenga pinnata* (Wurmb) Merr., or "bagot" as it is called by the natives, and the methods for its cultivation. The plant produces two kinds of "mayams" or spadices, male and female. The female spadix yields fruit but no juice, and the male *vice versa.* The saccharine juice collected from the male spadix contains a considerable amount of protein and will ferment quickly. The juice is often sterilized with smoke or hot water. The method of making the sugar is described in detail.—*H. C. Young.*

1893. Ghose, Manmathanath. **A neglected source of sugar in Bihar.** Agric. Jour. India 15: 32–39. *3 pl.* 1920.—A discussion of the date palms as a source of sugar. Methods of tapping and flow and composition of the juice are discussed. From good trees 5000 to 7000 grams of juice twice daily can be secured from the middle of April to the end of May. The percentage of sucrose in juice averages 12.5, there being no appreciable difference in the day and night collections. The date palm in Bihar is considered an important source of cheap white sugar.—*J. J. Skinner.*

# MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

1894. Bloch, E. **Modifications anatomiques des racines par action mecanique.** **[Anatomical modifications of roots by mechanical action.]** Compt. Rend. Acad. Sci. Paris 169: 195–197. 1919.—Author continues previous work on the effect of compression on the structure of various plant organs. Plants of *Raphanus raphanistrum, Helianthus oleraceum, Polygonum tartaricum,* and *Soja hispida* were used. It is noted that compression of the roots or rhizomes of these plants did not affect normal development of other parts of the plant. Roots

were confined in glass tubes, and their diameter much reduced. Such roots differed from those in contact with soil in having a much reduced surface layer which was only slightly waterproofed. The parenchyma is much reduced, and the medullary rays are abundantly lignified. In roots which normally develop fibers (*Solanum oleraceum*) such tissues are completely suppressed. On the other hand, the tissues of the vascular system are little modified. Author finds that there are "tissues of adaptation," which are modified by external conditions, and "functional tissues," which are little modified by external factors.—*V. H. Young.*

1895. Burkill, I. H. **Notes on Dipterocarps. No. 4.** Jour. Straits Branch Roy. Asiatic Soc. 81: 49–76. *213 fig.* 1920.—A continuation of notes No. 1, 2, and 3 in which the morphology of the seed and seedling of *Anisoptera costata* Korth, *Shorea macroptera* Dyer, *S. parvifolia* Dyer, *S. bracteolata* Dyer, *S. rigida* Brandis, *S. gibbosa* Brandis, *S. leprosula* Miq. and *S. robusta* Gaertn f. were given. The present note deals with the morphology of the embryo and seedling and position of the flower of *Dipterocarpus alatus* of Penang (?Rob), *D. fagineus* Vesque, *D. cornutus* Dyer, *D. sp. nov.*, *D. Scortechinii* King, *D. grandiflorus* Blanco, *D. crinitus* Dyer, *D. Kerrii* King, *Dyobalanops aromatica* Gaertn f., *Hopea micrantha* Hook f., *H. mengarawan* Miq., *Balanocarpus Curtisii* King, *B. zeylanicus* Trim., *Vatica nitens* King, *Retinodendron pallidum* King, *Anisoptera costata* Korth., *A. Curtisii* Dyer, *Balanocarpus penangianus* King, *Shorea costata* King, *S. materialis* Ridley, *S. gratissima* Dyer, *S. pauciflora* Dyer, *S. utilis* King, *S. macroptera* Dyer, *S. parvifolia* Dyer, *S. scutulata* King, *S. Curtisii* King, *S. sericea* Dyer, *S. rigida* Brandis, *S. bracteolata* Dyer, and *Pachynocarpus Wallichii.*—*T. F. Chipp.*

1896. Burkill, I. H. **Notes on Dipterocarps. No. 5.** Jour. Straits Branch Roy. Asiatic Soc. 81: 3–4. *5 fig.* 1920.—A description of the morphology of the embryo and seedling of *Balanocarpus maximus* King.—*T. F. Chipp.*

1897. De Wildeman, Em. **Sur la Macaranga saccifera Pax, Euphorbiacée myrmécophile de l'Afrique tropicale. [On Macaranga saccifera Pax, a myrmacophilous plant of tropical Africa.]** Compt. Rend. Acad. Sci. Paris 169: 394–396. 1919.—Author describes certain glands and sacs produced by the stipules of *Macaranga saccifera* Pax., a member of the Euphorbiaceae and a native of Belgian Congo and the surrounding country. Another species of Macaranga (*M. caladifolia* Beccari) has inflated hollow stems inhabited by ants; by some it is considered probable that the stipular sacs of *M. saccifera* are also inhabited by ants. Author finds that in spite of evidence of the presence of ants in the stipular sacs of the latter species, there is not enough evidence to conclude that the glandular structures found there are for the purpose of attracting ants. The matter of plant and ant symbiosis is briefly discussed.—*V. H. Young.*

1898. Dupler, A. W. **Staminate strobilus of Taxus canadensis.** Bot. Gaz. 68: 345–366. *3 pl., 22 fig.* 1919.—The staminate strobili occur in the leaf axils, the buds being first distinguished from other types by the broad apex. The sporophyll primordia first appear as slightly rounded lobes above the general surface and may arise in acropetal succession. The archesporial initials are hypodermal cells and develop in eusporangiate fashion; they are four to eight in number and are distributed around the margin of the primordium. The sporogenous tissue reaches the mother-cell stage about October 1, and forms microspores about two weeks later; there is no abortion of sporangia, such as occurs in *Torreya*, the sporangia occurring in a circle around the stalk of the sporophyll. The sporangium wall is usually two-layered; the tapetum arises from the peripheral layer of the sporogenous tissue and persists until after megaspore formation. The sporangium epidermis remains alive and thin-walled at the base, dehiscence being accomplished by the rupture of these cells at maturity, by the elongation of the stalk of the sporophyll; owing to the disintegration of the sporangium wall, the epidermis is the functional wall in the later stages. The strobilus matures the latter part of April; just before maturity there is an enlargement and elongation of the axis, pushing the sporophylls beyond the scales. The strobili of *Taxus canadensis* are somewhat smaller than those of *T. baccata.* The strobilus bundles are collateral endarch, excepting in the ter-

minal portions of the scale bundles and the sporophyll bundles, where they may be mesarch; and in the latter show indications of occasional exarch structure, the terminal portion of these bundles also being concentric.—*A. W. Dupler.*

1899. Harlan, Harry V. **Daily development of kernels of Hannchen barley from flowering to maturity at Aberdeen, Idaho.** Jour. Agric. Res. 19: 393–429. *Pl. 83–91, 17 fig.* 1920.

1900. Henry, Augustine, and Margaret G. Flood. **The Douglas Firs: a botanical and silvicultural study of the various species of Pseudotsuga.** Proc. Roy. Irish Acad. B, 35: 67–90. *Pl. 12–14.* 1920.—See Bot. Absts. 6, Entry 1544.

1901. Lecomte, Henri. **Sur la "structure etagée" de certains bois. [On the "storied structure" of certain woods.]** Compt. Rend. Acad. Sci. Paris 170: 705–709. 1920.—The author contends that it is preferable to restrict the term "storied wood" to cases in which the wood rays are of about equal depth and in tangential section appear arranged in successive layers as are the windows of most buildings. To instances where there are rays of two sizes, only one of which is so arranged, he applies the term "semi-storied." He does not believe the word "storied" should be used as referring to the wood elements. Nine species of legumes and representatives of other families are listed as having storied wood-structure.—*C. H. and W. K. Farr.*

1902. Morvillez, F. **L'appareil conducteur foliaire des Hamamélidacées et des formes voisines. [The foliar conductive system of the Hamamelidaceae and related forms.]** Compt. Rend. Acad. Sci. Paris 169: 542–545. *10 fig.* 1919.—Descriptions and drawings are presented of the foliar vascular apparatus of *Hamamelis virginiana L*; *Parrotia persica* D. C.; *Fothergilla alnifolia* L., *Disanthus cercidifolia* Max; *Bucklandia populnata* D. C.; *Liquidambar styraciflua* L.; *Altingia chinensis* Hook; *Platanus orientalis* L.; *Liquidambar imberbe* Ait., *Eriobotrya japonica* Lindl. and *Holodiscus discolor* Maxim. On the basis of these studies, the author has worked out a system of relationships among the groups of plants represented by the above species.—*V. H. Young.*

1903. Morvillez, F. **L'appareil libéroligneux foliaire des Bétulacées, Corylacées et Castanéacées. [The vascular anatomy of the leaves of the Betulaceae, Corylaceae, and Castaneaceae.]** Compt. Rend. Acad. Sci. Paris 170: 674–677. *12 fig.* 1920.—These families are found to differ in their foliar vascular anatomy in very much the same way as do the Chrysobalaneae and the Leguminoseae; namely, in the number and development of the projecting portions of the vascular ring at the distal end of the petiole. These lateral projections are held to be of significance as a family characteristic.—*C. H. and W. K. Farr.*

1904. Schellenberg, G. **Ueber einige Arten der Gattung Rourea Aubl. [Several species of the genus Rourea Aubl.]** Bot. Jahrb. 56 (Beiheft): 21–29. 1920.

1905. Watson, E. E. **On the occurrence of root-hairs on old roots of Helianthus rigidus.** Michigan Acad. Sci. Ann. Rept. 21: 235. 1919.—Root hairs were formed on roots occurring in the neighborhood of a bud at the end of a rhizome. These roots are one or two decimeters long. Root hairs occur throughout the entire length. They are 0.5 mm. or more long, nonseptate, and frequently branched, always dichotomously. Each comes from a small wedge-shaped epidermal cell.—*Richard de Zeeuw.*

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1906. Brotherus, V. F. **Musci Weberbaueriani.** Bot. Jahrb. 56 (Beibl. 123): 1–22. 1920.—Previous collections of the moss flora of Peru have not been very extensive or very numerous. The principal ones are those of A. Mathews, R. Spruce, and E. Ule, with scattered records from other collectors. The present report is based on the collection made

by Dr. A. Weberbauer in 1901–1905, which contained 91 species, 29 of which are described as new, and 42 of which were not previously known in Peru. The region is diverse, extending from the tropical lowlands to the alpine summits, and with a markedly different amount of rainfall. On the drier hills and half-deserts the mosses are mostly on the ground, stones, and the branches of shrubs. In the more humid regions the moss covering becomes very thick. In the tropical rain forest this massive development is not present, but the greater diversity of the species makes up in importance for lack in quantity. The *Sphagnum* area lies on the east side of the Andes. A list of the species collected is given, together with notes on distribution and taxonomy. The following species are described as new: *Andreaea peruviana, Barbula subreplicata, Bartramia anacolioides, B. feraristata, Campylopus Weberbaueri, Crossidium peruvianum, Cyclodiotyon flexicuspes, Dicranella longifolia, D. Weberbaueri, Encalypta peruviana, Entodon subflexipes, Fissidens ovicarpus, Funaria grossidens, Grimmia yaulensis, Isopterygium peruvianum, Lepidopilum splendens, Leptodontium laticuspes, L. laxifolium, Leucodon peruvianus, Mielichhoferia ampullacea, M. aristatula, M. plagiobryoides, M. subminutifolia, M. Weberbaueri, Pogonatum flaccidissimum, Prionodon fragilifolius, Ptychomitrium Weberbaueri, Schlotheimia calomitria, Streptopogon peruvianus*, and *Syrrhopodon diversifolius*.—*K. M. Wiegand.*

1907. Coulter, John M., and Merle C. Coulter. **Plant Genetics.** *ix + 214 p., 40 fig.* Univ. Chicago Press: Chicago, 1918.—See Bot. Absts. 2, Entry 395.

1908. Harshberger, J. W. **Alpine fell-fields of eastern North America.** Geog. Rev. 7: 233–255. *12 fig.* 1919.—See Bot. Absts. 3, Entry 1964.

1909. Land, W. J. G. **Multiple eggs in bryophytes.** [Rev. of: Florin, Rudolf. **Das Archegonium der Riccardia pinguis (L) B. Gr.** Svensk. Bot. Tidsk. 12: 464–470. *4 fig.* 1918. (See Bot. Absts. 2, Entry 1280.)] Bot. Gaz. 68: 392. 1919.—The reviewer calls attention to the frequency among the bryophytes of such so-called abnormalities as those described by Florin, and discusses their importance from a phylogenetic standpoint.—*A. W. Evans.*

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

### FUNGI

1910. Barlot, J. **Sur la détermination d'Amanites vénéneuses à l'aide de réactions colorées.** [**The identification of poisonous Amanitas by color reactions.**] Compt. Rend. Acad. Sci. Paris 170: 679–681. 1920.—Color reactions with various chemicals are found to be of assistance in distinguishing the poisonous from non-poisonous species of *Amanita*. No single reaction has been found which is absolutely diagnostic, but three deadly species turn black when treated with a drop of fresh blood to which has been added some potassium ferrocyanide. Other reactions are found for other species.—*C. H. and W. K. Farr.*

1911. Bessey, E. A. **Guide to the literature for the identification of fungi—A preliminary outline for students and others.** Michigan Acad. Sci. Ann. Rept. 21: 287–316. 1919.—A list of the more accessible general works and special monographs on fungi has been prepared for the service of students. "No attempt is made to cover the older literature; with few exceptions, only those special studies are noticed that have appeared since the first volume of Saccardo saw light." "Only those works are listed that bear upon groups more or less represented in the United States, particularly the eastern half." The bibliography given takes up first the general works, hand books and host indexes, and then special works for limited groups of fungi. The arrangement of the special articles cited follows the systematic arrangement of the fungi. Approximately 700 titles are included in the list given.—*G. H. Coons.*

1912. Bessey, E. A., and Bertha E. Thompson. **An undescribed Genea from Michigan.** Mycologia 12: 282–285. *Pl. 20.* 1920.—A *Genea* with rectangular ascospores is described as *G. cubispora* sp. nov.—*H. R. Rosen.*

1913. Chipp, T. F. **A host index of fungi of the Malay Peninsula. II.** Gardens' Bull. Straits Settlements 2: 276–282. 1920.—A conclusion of the summary of fungous diseases of plants in Malaya as hitherto recorded.—*T. F. Chipp.*

1914. Dickson, B. T. **Onygena equina (Willd.) Pers.** Mycologia 12: 289–291. *1 fig.* 1920.—Reports *Onygena equina* growing on cow's horns and hoofs at Quebec, Canada.—*H. R. Rosen.*

1915. Fitzpatrick, Harry Morton. **Monograph of the Coryneliaceae.** Mycologia 12: 239–267. 1920.—The conclusion of work previously noted (see Bot. Absts. 6, Entry 1217). The genus *Corynelia* is described and a key to species is given, followed by a description of each species. The following new species are included: *C. bispora*, *C. nipponensis*, *C. brasiliensis*, *C. portoricensis*, and *C. jamaicensis*. Doubtful and excluded species of the family are discussed, and in this connection *Hypsotheca thujiana* E. & E. is listed as probably belonging to the genus *Caliciopsis.*—*H. R. Rosen.*

1916. Fraser, W. P. **Cultures of Puccinia Clematidis (DC.) Lag. and Puccinia Impatientis (Schw.) Arth.** Mycologia 12: 292–295. 1920.—Overwintered telial material of *Puccinia Clematidis* on *Hystrix patula* produced infections on *Actaea rubra*, with the production of aecia. These aecia as well as others collected in the field were inoculated and produced infections on the following grasses: *Elymus canadensis*, *E. virginicus*, *Hordeum jubatum*, *Hystrix patula*, and *Agropyron Richardsonii*. According to E. B. Mains the aecial and telial material corresponds to the European *Puccinia Actaeae-elymi* Mayor and *P. Actaeae-agropyri* Ed. Fisch. It seems best to include these under one species, *P. Clematidis* (DC.) Lag., which is made up of several races. Inoculations with aeciospores from *Thalictrum dasycarpum* produced infections on *Bromus ciliatus*, *B. latiglumis*, *Elymus canadensis*, and *E. virginicus*. Since the resulting teliospores on *Bromus* were of the many-celled type, and on *Elymus* of the two-celled type, the author believes that the *Thalictrum* aecia used in the inoculations consisted of a mixture of aecia of two races. Using aecial material of *Puccinia impatientis* (Schw.) Arth. on *Impatiens biflora* the following grasses were infected: *Agropyron tenerum*, *A. Richardsonii*, *Hystrix patula*, *Elymus canadensis*, *E. virginicus*, and *Hordeum jubatum.*—*H. R. Rosen.*

1917. Grove, W. B. **Species placed by Saccardo in the genus Phoma. Part II.** Kew Bull. Misc. Inf. [London] 1919: 425–445. *Fig. 1–6.* 1919.—For part I, see Kew Bull. Misc. Inf. [London] 1919: 177–201.—Includes lists of host plants for parts I and II.—*E. Mead Wilcox.*

1918. Lehman, S. G. **Penicillium spiculisporum, a new ascogenous fungous.** Mycologia 12: 268–274. *Pl. 19.* 1920.—From healthy cotton rootlets a *Penicillium* was obtained which produced perithecia in abundance on various culture media. It is described as *P. spiculisporum* sp. nov.—*H. R. Rosen.*

1919. Murrill, W. A. **A new Amanita.** Mycologia 12: 291–292. 1920.—*Venenarius Wellsii* sp. nov. is described. "For the benefit of those following Saccardo . . . . the combination *Amanita Wellsii*" is added.—*H. R. Rosen.*

1920. Murrill, W. A. **Kauffman's Agaricaceae.** [Rev. of: Kauffman, C. H. **The Agaricaceae of Michigan.** Michigan Geol. and Biol. Surv. Publ. 26. Vol. 1 (text), *xxvii + 924 p.* Vol. 2 (plates), *10 p. text and 172 pl.* 1918.] Mycologia 12: 166. 1920.—The reviewer regards this as a "stupendous piece of work splendidly done."—*H. R. Rosen.*

1921. Ritzema Bos, J. **Boekaankondiging.** **[Book review.]** [Rev. of: Oudemans, C. A. J. A. **Enumeratio systematica fungorum.** Vol. I. *cxxvi + 1230 p.* Martinus Nijhoff: The Hague, 1919.] Tijdschr. Plantenz. 25: 210–211. 1919.—A critical review.—*H. H. Whetzel.*

1922. Vuillemin, Paul. **Fructifications de Champignons decouvertes dans l'ongle par Louis Jannin. [The fructifications of fungi found on finger-nails by Louis Jannin.]** Compt. Rend. Acad. Sci. Paris 170: 788–790. 1920.

1923. Zundel, George L. **Some Ustilagineae of the state of Washington.** Mycologia 12: 275–281. 1920.—There are recorded forty-two species of smuts, including *Tilletia guyotiana* Har. and *T. rauwenhoffii* Fisch. de Wald.—two species which are said to be here recorded for the first time from North America.—*H. R. Rosen.*

## BACTERIA

1924. Danysz, J. **La vie d'un microbe, individu et espèce. [The life of a microbe individual and species.]** Compt. Rend. Acad. Sci. Paris. 169: 104–106. 1919.

# PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

1925. Berry, E. W. **A fossil sea bean from Venezuela.** Amer. Jour. Sci. 50: 310–313. *1 fig.* 1920.—Describes a fossil sea bean, *Entada boweni*, which is almost identical with the existing *Entada scandens*, and comes from the Miocene of the foot-hills of the Sierra de Merida in Venezuela.—*E. W. Berry.*

1926. Berry, E. W. **Contributions to the Mesozoic flora of the Atlantic Coastal Plain, XIII.—North Carolina.** Bull. Torrey Bot. Club 47: 397–406. *Fig. 2.* 1920.—A summary account of the Upper Cretaceous flora of North Carolina. Many well-known Upper Cretaceous species are enumerated and fruits of *Ficus* and species of *Aristolochites*, and *Carpolithus* are described as new.—*E. W. Berry.*

1927. Berry, Edward W. **Paleobotany: A sketch of the origin and evolution of floras.** Smithsonian Report 1918: 289–407. *6 pl., 42 fig.* 1920.—A general account of the science, with an illustrated discussion of the morphology, habits, and phylogeny of plants, and a description of the successive floras of geologic time.—*E. W. Berry.*

1928. Carpentier, Alfred. **Sur les fructifications du Sphenopteris herbacea Boulay. [On the fructifications of Sphenopteris herbacea Boulay.]** Compt. Rend. Acad. Sci. Paris 169: 511–513. 1919.

1929. Scott, D. H. **The relation of the seed plants to the higher cryptogams.** (Abstract.) Rept. British Assoc. Adv. Sci. 1919: 334. 1920.

1930. White, O. E. **The ancient history of plants.** Brooklyn Bot. Gard. Leafl. $8^{3-4}$: 1–8. 1920.

1931. Yabe, H., and Endo, S. **Discovery of a stem of Calamites from the Paleozoic of Japan.** Jour. Geol. Soc. Tokyo 27: 65–69. *1 fig.* 1920.—The coal measures of China, Manchuria, and to a less extent Korea are abundantly plant bearing, but in Japan these are represented by marine limestones. No remains of terrestrial vegetation of Carboniferous age have been known from Japan except a supposed fragment of a Sigillaria which is very doubtful both as to age and identity. The authors record from what is probably the Chichibu formation, of Carboniferous age, a fragment of a calamite whose anatomical characters suggest the Arthropitys type of calamite stem structure. The material which came from marine beds in the province of Iwami, is not sufficiently well preserved to permit a more precise identification.—*E. W. Berry.*

# PATHOLOGY

G. H. Coons, *Editor*

C. W. Bennett, *Assistant Editor*

1932. Anonymous. **Beschädigungen an Eichen durch Diaporta taleola Tul. [Injury to oak by Diaporta taleola Tul.]** Schweiz. Zeitschr. Fortsw. 69: 62–63. *Frontispiece.* 1918.—The disease described by Moreillon in *Forestier Suisse*, according to Dr. Schellenberg, is caused by *Diaporthe* (*Aglaospora*) *taleola*. A description and illustration of the affected tree and a short description of the organism.—*D. Reddick.*

1933. Anonymous. **The ring or Bangadi disease of potato.** Leaflet Dept. Agric. Bombay 1918: 3. 1918.—This ring disease, known to the people as *bangadi* or *chari*, is characterized at first by partial and later by complete withering of the potato plants, which then turn brown and dry up. Cross sections of tubers from diseased plants show a brown ring from which a cream-yellow bacterial slime oozes under slight pressure. Both field and storage rots result. It appears to be spread in the field by irrigation water. The disease originates in infected seed and is therefore to be avoided by the use of healthy seed, proper disinfection of the cutting knife after a diseased tuber is cut, and by good field sanitation and drainage since the trouble develops most seriously in water-logged areas. The name of the causal organism is not given.—*H. A. Edson.*

1934. Anonymous. **Bestrijding van schurftziekte bij appelen en peren. [Control of scab on apples and pears.]** Tijdschr. Plantenz. 26: 108. 1920. Newsletter No. 13 of the Phytopathological Service, March, 1920.—Outlining spraying program, and methods of making spray mixtures.—*H. H. Whetzel.*

1935. Bessey, E. A. **The effect of parasitism upon the parasite—A study in phylogeny.** Michigan Acad. Sci. Ann. Rept. 21: 317–320. 1919.—In a brief account, the writer considers various steps involved in change from the holophytic to parasitic habit in plants of various orders of evolutionary complexity. Epiphytism is considered the first step toward parasitism. "The next step seems to have been partial or total endophytism." This type of relationship shows various degrees from the simple shelter and partial feeding in Chlorochytrium, to the endophytism shown in certain red seaweeds which, while still possessing chloroplasts, adopt a filamentous form of structure. Among the higher plants the mistletoes (*Viscum* or *Phoradendron*) are comparable to this type of relationship. Following endophytism true parasitism is found either intra- or intercellular in the host relationship. In the case of complete parasitism, a considerable reduction of the plant body and an increase in size of reproductive structures take place, but among the yeasts and some other forms a reduction of the reproductive structures occurs. Clearly the simpler the structure to begin with, the slighter the change beyond loss of chlorophyll and chloroplasts. With the plants of more complicated vegetative structure two tendencies appear—a simplification and reduction of all organs for photosynthesis, and an emphasizing of the reproductive portions. When, however, the former tendency is carried too far, as in the yeasts, the reproductive portion has to be reduced as well.—*G. H. Coons.*

1936. Bintner, J. **Silver leaf disease. Stereum purpureum.** Kew Bull. Misc. Inf. [London] 1919: 241–263. *Pl. 8, fig. 1–8.* 1919.—This disease is known to attack the following plants:—*Prunus* spp., *Malus sylvestris*, *Exochorda* sp., *Neviusia alabamensis*, *Philadelphus* sp., *Spiraea japonica glabrata*, *Ribes cereum*, *Ribes* spp. (currants and gooseberries), *Laburnum alpinum* and *vulgara*, *Syringa* sp., *Aesculus carnea* and *hippocastanum*, *Pernettya mucronata.* The hyphae of this pathogene are always found in the stem and roots of silver-leaf trees, though they have never been found in either the petiole nor the leaf blades of such trees. True silver leaf caused by this pathogene is distinguished from false silver leaf not caused by any organism. Infection occurs through wounds on stems or roots. A bibliography and historical account of the disease are given.—*E. Mead Wilcox.*

1937. Chipp, T. F. **A host index of fungi of the Malay Peninsula. II.** Gardens' Bull. Straits Settlements 2: 276–282. 1920.—See Bot. Absts. 6, Entry 1913.

1938. Coons, G. H. **The Michigan plant disease survey for 1918.** Michigan Acad. Sci. Ann. Rept. 21: 331–343. *Pl. 15.* 1919.—Reports are given upon the disease occurrence in cereals, fruits, etc., in Michigan in 1918. These are the result of observations by the author and by other persons coöperating. A short discussion of "The weather of 1918" and "Weather injury to plants" precedes the accounts of the different crops and their diseases.—*E. A. Bessey.*

1939. Coons, G. H., and Genevieve Gillette. **Phenol injury to apples.** Michigan Acad. Sci. Ann. Rept. 21: 325–329. *Pl. 14.* 1919.—As a result of tests in exposing apples to the fumes of phenol in concentrations as low as 1 to 1000, blackening of the skin and flesh occurred, the speed of reaction increasing with concentration of phenol and with temperature. The reaction did not take place with apples which had been killed by boiling. With apple juice, discoloration occurred with apple cells in the juice but not in the juice itself, upon the addition of phenol. "The reaction is connected with living cells and is not the mere chemical effect of one substance upon another. The response of mature cells and the failure of the dead cells in the mellow apples to respond point to the possibility of this substance furnishing a criterion for active and for dead cells." It may be that the phenol reacts with some oxydizing enzyme. such as tyrosinase, producing the blackening.—*G. H. Coons.*

1940. Coons, G. H., and H. H. McKinney. **Formaldehyde injury to wheat.** Michigan Acad. Sci. Ann. Rept. 21: 321–324. 1919.—In a preliminary note authors summarize results of experiments on formaldehyde injury to wheat. The injury is readily produced in the laboratory, wheat being more sensitive than oats, barley, or rye. The standard wet treatment (1 pint of formaldehyde to 40 gallons of water) or the new dry treatment (1 pint of formaldehyde atomized on 50 bushels of grain) reduces germination slightly—but not more than 10 per cent. Formaldehyde does not air readily out of grain. The action of this relict formaldehyde is cumulative, its toxic action being shown either by killing of embryo or by the production of grave distortion. Under cold, wet conditions very little formaldehyde will air from grain. Damp soil readily takes up formaldehyde from grains, preventing damage. Dry soil does not take up formaldehyde readily. Toxicity of formaldehyde varies with the dilution. The experiments were performed with small quantities of wheat in low glass dishes, and the amount of formaldehyde used was calculated from the delivery of an atomizer. The treated grain was germinated in soil, blotting paper results not being found to compare with field studies.—*G. H. Coons.*

1941. Dufrénoy, Jean. **Sur les tumeurs bactériennes expérimentales des pins. [On experimental bacterial tumors of pines.]** Compt. Rend. Acad. Sci. Paris 169: 545–547. 1919.—*Pinus sylvestris* and *P. laricio* are deformed by tumors identical with those affecting *P. maritima* and capable of transmission from tree to tree. By means of needle inoculations from tree to tree, cankers were obtained in a few months and resinous tumors in a year. The anatomy of these tumors is briefly described. The causal organism is an unnamed Coccus of which pure cultures were obtained by inoculating media directly from the host. The organism brings about hyperplasia in the infected regions, and finally the tissues break down leaving a resinous mass.—*V. H. Young.*

1942. Ehrhorn, E. M. **Notes on plant shipment.** Hawaiian Forester and Agric. 17: 4–6. 1920.—This article emphasizes the importance and necessity for the rules issued by the Division of Plant Inspection, and gives also directions for the safe shipment of p'ants under the rules.—*Stanley Coulter.*

1943. Fisher, D. F., and Newcomer, E. J. **Pear scab in the Pacific Northwest.** Better Fruit 14[9]: 3–6. 1920.—A verbatim excerpt from U. S. Dept. Agric. Farmers Bull. 1056. 1919.

1944. Fryer, Percival J. **Insect pests and fungus diseases of fruit and hops.** *xv + 728 p., 24 pl.* University Press: Cambridge, England, 1920.

1945. Gunderson, A. J. **Some facts about dry lime-sulphur.** Better Fruit 14[10]: 42. 1920.—This is a detailed account of the spraying and killing efficiency of dry lime-sulphur as compared with ordinary boiled lime sulphur. The chemical composition of dry lime-sulphur is considered in detail.—*A. E. Murneek.*

1946. Heinsius, H. W. **Kort verslag van de algemeene vergadering op vrijdag 20 juni 1919, in den hortus botanicus te Amsterdam. [Secretary's report of the annual meeting of the Phytopathological Society of Holland.]** Tijdschr. Plantenz. 25: 202–204. 1919.

1947. Hiley, W. E. **The fungal diseases of the common larch,** *8 vo., xii + 204 p., 73 pl.* Clarendon Press: Oxford, 1920.

1948. Kühr, C. A. H. von Wolzogen. **Het zure bibitrot bij het suikerriet. [Sour cutting-rot of sugar cane.]** Arch. Suikerindust. in Nederlandsch-Indië 28: 703–756. *24 fig.* 1920. Also, Mededeel. Proefstat. Java Suikerindust. Landb. Ser. 1920, No. 3.—The sour cutting-rot retards or kills small scattered areas in the young cane fields, giving an appearance similar to damage resulting from the "pineapple" disease. The interior of affected cuttings shows a red to brown discoloration in more or less irregularly scattered patches and has a sour odor. The affected cutting is found to be at first acid, but later in the course of the fermentation it is alkaline, doubtless through ammonia production. The initial process is typically an acetic acid fermentation, though in exceptional cases of poor soil aeration lactic and butyric acid fermentations occur. A number of different bacteria were cultivated from sap expressed from affected cuttings, and their fermenting ability was studied *in vitro*. Isolation of a specific organism was not attempted, and controlled inoculation experiments were not made. The writer believes that the fermentation of the cuttings is caused by common soil bacteria, and that the harmful effect on the plant is due to the absorption from the cutting of the acids produced in the fermentation occurring before the roots become well enough established to make the plant independent of the cutting. For control the writer recommends the improvement of all conditions which further the rapid germination and establishment of the plantlets on their own roots.—*R. D. Rands.*

1949. Mann, Harold H., S. D. Nagpurkar, and G. S. Kulkorni. **The "Tambera" disease of potato.** Agric. Jour. India 15: 282–288. *4 pls.* 1920.—The disease which prevailed in the Poona district of western India, known locally as "Tambera," was found to be caused by mites. A description of the affected plants is given, and remedies are suggested.—*J. J. Skinner.*

1950. Meier, F. C. **Control of watermelon anthracnose by spraying.** U. S. Dept. Agric. Dept. Circ. 90: 3–11. *8 fig.* 1920.—"The most practicable method of reducing the damage done by anthracnose is to spray the watermelon vines with 4-4-50 bordeaux mixture." This operation will also help to control other diseases of the crop. Directions are given regarding time and manner of spraying and for the preparation of bordeaux. The disease is described, and the method by which the causal fungus (*Colletotrichum lagenarium*) is spread is discussed. —*L. R. Hesler.*

1951. Nicolas, G. **Sur la respiration des plantes parasitees par des champignons. [The respiration of plants parasitized by fungi.]** Compt. Rend. Acad. Sci. Paris 170: 750–752. 1920.—A comparison of the carbon dioxide-oxygen ratio of sound and diseased specimens of five genera of angiosperms. Seven genera of fungi were involved as disease-producing organisms. It is found that the respiration of organs parasitized with endophytes, such as rusts and *Cystopus*, and by subcuticular fungi, such as *Taphrina*, is greater than that of sound organs. The reverse is true of organs attacked by ectophytes, such as mildew. *C. H. and W. K. Farr.*

1952. OWEN, M. N. **The skin spot disease of potato tubers (Oospora pustulans).** Kew Bull. Misc. Inf. [London] 1919: 289–301. *Pl. 11, 11 fig.* 1919.—This is a storage disease of Irish potato tubers, caused by the fungous pathogene *Oospora pustulans*, here described as a new species by OWEN AND WAKEFIELD. It is shown to be distinct from *Spicaria solani* Harting, which name has been assigned to it by other authors. Small dark spots occur scattered over the surface of the tuber. Infection near the eyes may kill the buds. Diseased tubers should not be planted.—*E. Mead Wilcox.*

1953. PARSONS, T. H. **Notes on the effects of shell fire on trees in woods in France.** Kew Bull. Misc. Inf. [London] 1919: 231–233. *Pl. 6–7.* 1919.

1954. PELTIER, G. L. **A summary of the citrus canker investigation in south Alabama.** Proc. Gulf Coast Hortic. Soc. 4: 21–22. 1918.

1955. PELTIER, GEORGE L., AND WILLIAM J. FREDERICH. **Relative susceptibility to citrus-canker of different species and hybrids of the genus Citrus, including the wild relatives.** Jour. Agric. Res. 19: 339–362. *Pl. 57–68.* 1920.—Continuation of previous work. (See Bot. Absts. 1, Entry 924.) The tests were made both in greenhouse and in field. With a single exception the data confirm those of LEE (Bot. Absts. 2, Entry 774). *Pseudomonas citri* has a wide range of hosts and is not limited to the genus *Citrus*. Of the rutaceous plants not closely related to *Citrus*, infection was secured on *Casimiroa edulis*, *Chalcas exotica*, and *Claucena lansium*. The lesions are non-typical, unruptured spots and occur at wounds or scratches on the leaves. *Xanthoxylum* sp. and *Glycosmis pentaphylla* are immune.—In the tribe Citreae species in sub-tribes have been tested as follows: In Angelinae, *Chaetospermum glutinosum* is susceptible, with lesions somewhat like those on *Citrus*; *Aegle marmelos* is slightly susceptible; *Balsamocitrus dawei* and *Aeglopsis chevalieri* are immune. In Feroninae, *Feronia limonia* and *Feroniella lucida* were infected, and lesions developed in absence of wounds. In Lavanginae, *Hesperthusa crenulata* was infected on twigs and leaves, although the lesions are non-typical, while *Triphasia trifolia* and *Severinia buxifolia* are immune. In Citrinae, all plants tested were infected, only *Citropsis schweinfurthii* and *Fortunella margarita, japonica* and *crassifolia* showing any marked resistance.—Only those wild relatives which were most susceptible in the greenhouse could be infected in the field. So far as the citrus industry of U. S. A. is concerned none of the wild relatives, native or introduced, now growing in the citrus districts is susceptible enough to have any bearing on the national program for the eradication of citrus canker. A possible exception is *Poncirus trifoliata*.—The species of *Citrus* show no change in relative susceptibility from previous report. *Citrus nobilis* and its varieties are resistant.—Of the hybrids, those having *Poncirus trifoliata* as one parent are susceptible; citrange hybrids, particularly citrangequats, are decidedly resistant.—All false hybrids are extremely susceptible.—*D. Reddick.*

1956. PUTTERILL, V. A. **Flag smut of wheat.** Jour. of Dept. Agric. Union of South Africa, 1: 252–257. *5 fig.* 1920.—Flag smut in wheat, caused by *Urocystis tritici*, has recently been recorded from Zeerust district. An outline is given of the life history of the fungus, and preventive measures are suggested.—*E. M. Doidge.*

1957. RAMBOUSEK, FR. **Rübenschädlinge und Rübenkrankheiten im Jahre 1917. [Enemies and diseases of beets in 1917.]** Zeitschr. Zuckerind. Böhmen 42: 527–539. 1918.

1958. RITZEMA BOS, J. **Boekaankondiging. [Book review.]** [Rev. of: J. KOK. **Vijanden van landbouwgewassen. (Enemies of cultivated plants.)** 2d. ed. 1919.] Tijdschr. Plantenz. 26: 115–116. 1920.—The contents of the work are divided into three parts, the first dealing with injuries due to the environment; the second, injuries due to animals including insects; and the third part dealing with diseases due to pathogenic plants, especially the fungi. A list of errors and misstatements found in the book is given.—*H. H. Whetzel.*

1959. Schoevers, T. A. C. **Ziekten van aardappel knollen.** **[Diseases of potato tubers.]** Tijdschr. Plantenz. 26: 5–20. *3 pl., 13 fig.* 1920.—A brief description of twenty diseases affecting the tubers of potato. The symptoms, especially those exhibited by the tubers, are described, and standard methods for control are given. Among the diseases described are: *Rhizoctonia* disease, Wart, *Fusarium* rot, scab, tuber proliferation, bacterial soft rot, red rot, *Phytophthora* rot, ring necrosis, silver scurf, *Verticillium* disease, nematode disease, hollowness, and powdery scab. Half-tone illustrations of many of the diseases and a key for determining the diseases from an examination of the tubers, accompany the text.—*H. H. Whetzel.*

1960. Schreiner, Oswald, B. E. Brown, J. J. Skinner, and M. Shapovalov. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84: *35p.* *25 fig.* 1920.—See Bot. Absts. 6, Entry 1431.

1961. Stäger, R. **Beitrag zur Verbreitungsbiologie der Claviceps-Sklerotien.** **[Dissemination of Claviceps sclerotia.]** Verh. Schweizer Naturw. Gesell. 99: 236–237. 1918.—Sclerotia of *Claviceps* do not simply fall to the ground and lie there until the following spring. They may be spread widely with the host (sclerotia from *Brachypodium*, *Agropyrum*, *Lolium*, *Arrhenatherum elatius*, and *Alopecurus myosuroides*); they may be disseminated by the inherent condition of low specific gravity which allows them to float on water (sclerotia from *Molinia coerulea*, *Glycerina fluitans*, *Phalaris* and *Phragmites*); they may be distributed by a union of the distribution apparatus of host and parasite to mutual advantage (as in case of species of *Holcus*, *Poa nemoralis*, *P. annua* and *Dactylis glomerata*); with sclerotia of low specific gravity, wind transport is possible. A combination of wind and water movement exists for sclerotia from *Phragmites* and *Calamagrostis arundinacea*. [Through abst. by Matouschek in: Zentbl. gesamte Landw. 1, Entry 355. 1919.]—*D. Reddick.*

1962. Stehlik, W. **Bekämpfung des Wurzelbrandes bei der Zuckerrübe durch ihre Züchtung.** **[Control of sugar beet root-rot by breeding.]** Öst-Ung. Zeitschr. Zuckerind. u. Landw. 47: 1–10. 1918.—[Abst. by Molz in: Zentralbl. gesamte Landw. 1, Entry 277. 1920.]

1963. Taubenhaus, J. J. Diseases of greenhouse crops and their control. Dutton & Co.: New York, 1920.

1964. Thornber, J. J. **Plant disease inquiries.** Arizona Agric. Exp. Sta. Rept. 1917: 431–432. 1918.—A short list of diseases occurring in Arizona in 1917.—*D. Reddick.*

1965. Valleau, W. D. **Seed corn infection with Fusarium moniliforme and its relation to root and stalk rots.** Kentucky Agric. Exp. Sta. Bull. 226: 25–51. *Fig. 1.* 1920.—An examination to determine the seed-borne organisms in seed of *Zea Mays* L. which might cause root and stalk rots of corn resulted in finding *Fusarium moniliforme* Sheldon in all samples of corn examined from the states of Kentucky, Kansas, Arkansas, Missouri, Tennessee, Georgia, Mississippi and Minnesota. No disease-free ears were found, and practically one hundred per cent infection of kernels on an ear was the rule. Infection on an ear was found not to be localized. The high degree of seed infection probably explains the equally extensive root infection under field conditions. The rag doll and other germinators in which seedlings were grown only to a height of 3 or 4 inches were of little value in determining the extent of kernel infection on an ear. Sand germinators in which the seedlings were grown to a height of 12 to 22 inches were used, the seedlings being removed and washed and the roots and stems examined for lesions. The development of pink, scarlet, purple, or black discolorations within the seed coats, in any type of germinator indicated infection with *F. moniliforme*. Pink discolorations on dry white kernels are an indication of infection. Isolations from rotting roots and stalks in the field yielded *F. moniliforme* in the majority of cases. Infection with *F. moniliforme* generally has little effect on the germination or early vigor of the resulting seedling.—*W. D. Valleau.*

1966. Van der Bijl, Paul A. **A list of host-plants of some of the Loranthaceae occurring round Durban, Natal.** South African Jour. Sci. 16: 345–347. 1920.—These mistletoes not only occur on a large number of South African plants, but have also adapted themselves to a number of introduced trees, including fruit trees.—*E. P. Phillips.*

1967. Verhoeven, W. B. L. **Zaaigraanonsmetting. [Seed grain disinfection.]** Tijdschr. Plantenz. 26: 24–27. 1920.—A reprint of Vlugschrift No. 16 of the Phytopathological Service issued December, 1919. Standard directions for seed treatment to control the following diseases are given: Stinking smut of wheat and barley with copper sulphate, formalin, and Uspulum; loose smut of wheat and barley with hot water; oat smut with hot water; stripe of barley with copper sulphate; stem smut of rye with copper sulphate; seedling mold of wheat, oats, barley,and rye with hot water or copper sulphate.—*H. H. Whetzel.*

1968. Vermorel and Dantony. **Efficacité comparée de bouilles bordelaises ordinaires et des bouilles bordelaises caséinées pour la préservation des grappes. [Comparative efficiency of ordinary bordeaux mixture and bordeaux mixture with the addition of casein in the treatment of grapes.]** Compt. Rend. Acad. Sci. Paris 169: 439–440. 1919.—Experiments were carried out with bordeaux mixture to which was added fifty grams of casein per hectoliter. Chemical tests of grape tissues over a period of forty-five days indicated that the mixture adheres much better if casein is added and that it remains on the tissues in spite of rain and unfavorable weather conditions without loss of efficiency.—In the treatment of grapes for mildew this promises to be a great advantage, since the spray is not easily applied to the fruits except when the leaves are small and consequently must be of a type which adheres well and does not lose its efficiency.—*V. H. Young.*

1969. Volkerz, K. **Iets over plaatselijk onderzoek van bloembollenziekten. [Remarks on the locating of investigations on bulb diseases.]** Tijdschr. Plantenz. 26: 61–70. 1920.—The writer urges that scientific investigations on plant diseases be conducted in the fields or in localities where conditions for normal crop production of the host is best.—*H. H. Whetzel.*

1970. Wester, P. J. **The coconut, its culture and uses.** Philippine Agric. Rev. 11: 5–57. 1918.—Diseases of coconut are reviewed briefly on pages 45 to 47.—*D. Reddick.*

1971. Woodcock, E. F. **Observations on the potato disease conditions in Michigan for the summer of 1918.** Michigan Acad. Sci. Ann. Rept. 21: 281–285. 1919.—A summary of data showing distribution and extent of injury by potato diseases in the summer of 1918, in Michigan.—*G. H. Coons.*

1972. Zundel, George L. **Some Ustilagineae of the state of Washington.** Mycologia 12: 275–281. 1920.

## PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

1973. Anonymous. **Datura Stramonium, "Stinkblaar," "Stramonium" or "Thorn Apple."** South African Jour. Indust. 3: 455–461. 1920.

1974. Anonymous. **Momordica cochinchinensis.** Kew Bull. Misc. Inf. [London] 1920: 6–12. 1920.—The oil from the seeds may possibly be employed in the manufacture of paints and varnishes.—*E. Mead Wilcox.*

1975. Anonymous. **Strychnos nux-vomica in Cochin China.** Kew Bull. Misc. Inf. [London] 1919: 238–239. 1919.—The plant is found to be indigenous to Cochin China.—*E. Mead Wilcox.*

1976. Bliss, A. R. **Proposed vegetable drug deletions.** Jour. Amer. Pharm. Assoc. 9: 767–771. 1920.—A summarized report of answers received from 387 physicians of Atlanta, Georgia, relative to the various vegetable drugs of the United States Pharmacopoeia, in regard to their retention or deletion. Author gives a list of 31 drugs which more than 50 per cent of the physicians favored deleting. Another list of 30 received absolute unanimity of opinion for retention. Comments by the author are included as to the necessity for the deletion of such drugs as aconite on account of the dangers attending its use; squill, on account of its indesirable side actions; pepo, claimed to be absolutely worthless; and gelsemium, which is of no great medicinal importance. Author presents a list of 22 drugs which might well be deleted. The suggestion is offered to delete the crude drugs in case of aromatic oil drugs and to retain their respective volatile oils.—*Anton Hogstad, Jr.*

1977. Bourquelot, Em., and M. Bridel. **Recherche et caractérisation du glucose dans les végétaux, par un procédé biochimique nouveau. [The detection of glucose in plants by a new biochemical process.]** Compt. Rend. Acad. Sci. Paris 170: 631–635. 1920.—See Bot. Absts. 6, Entry 2002.

1978. Grant, E. H. **New tests for some purgative drugs.** Jour. Amer. Pharm. Assoc. 9: 763–766. 1920.—A series of new color tests for a number of purgative drugs, namely, Scammony, Jalap, Leptandra, Gamboge, Podophyllum, Senna, Rhubarb, Butternut (bark of root), Cassia Fistula, and Chionanthus. The tests given for Gamboge, Podophyllum, Senna, Rhubarb and Chionanthus were found to be quite characteristic; the other tests while being far from conclusive, are of value in assisting to identify these drugs.—*Anton Hogstad, Jr.*

1979. Hoffstein, B. H. **Notes on henna.** Amer. Jour. Pharm. 92: 543–547. 1920.—A brief review of the historical usages of henna. Analysis of one of the so-called henna hair dyes disclosed the following combination: powdered sumac, henna, ferrous sulphate, and copper sulphate. Another sample was found to contain pyrogallol and henna in one container, and a mixture of ammonium chloride and copper sulphate in the other. Attention is called to the erroneous statement that henna does not contain tannin, which has been copied and recopied from time to time. Method for the extraction of the tannin is given as follows: Extract chlorophyll with ether; then percolate with 90 per cent alcohol; distil off the alcohol and again exhaust the syrupy residue with ether; dissolve residue in 95 per cent alcohol and again distil off alcohol. This method yields a resinoid tannin, which is soluble in hot water and capable, like other tannins, of reacting with ferric salts and gelatine.—*Anton Hogstad, Jr.*

1980. Kraemer, Henry. **Michigan—An important source of raw vegetable products.** Michigan Acad. Sci. Ann. Rept. 21: 167–199. 1919.—The author notes the influence of the Great War on the supply of raw vegetable products, especially crude drugs in America, and points out the desirability of cultivating many of the common medicinal plants in the United States. A short account is given of efforts that have already been made along this line and the obstacles to be overcome. One noteworthy success is mint oil culture in Michigan. Michigan contains many wild medicinal plants and has a climate favorable to the cultivation of many European drug plants. At the present time it has a greater acreage devoted to the cultivation of medicinal plants than any other state. The author presents a summary of recent experiments in the growing of medicinal plants at the University of Michigan botanical gardens. About fifty different species were grown, with a total of 20,000 individual plants, of which 15,000 were harvested, giving abundant material for tests.—*H. T. Darlington.*

1981. Leape, H. M., and H. E. Annett. **Investigations concerning the production of Indian opium for medicinal purposes.** Agric. Jour. India 15: 124–134. 1920.—See Bot. Absts. 6, Entry 1422.

1982. Marsh, C. Dwight, and A. B. Clawson. **Astragalus tetrapterus, a new poisonous plant of Utah and Nevada.** U. S. Dept. Agric. Dept. Circ. 81: 3–6. *2 fig.* 1920.

1983. Marsh, C. Dwight. **A new sheep-poisoning plant of the southern states.** U. S. Dept. Agric. Dept. Circ. 82: 1–3. *1 fig.* 1920.—*Daubentonia longifolia.*

1984. Marsh, C. Dwight, and Glenwood, C. Roe. **Sweet-clover-seed screenings not injurious to sheep.** U. S. Dept. Agric. Dept. Circ. 87: 3–7. 1920.

1985. Marsh, C. Dwight. **The whorled milkweed, a plant poisonous to livestock.** U. S. Dept. Agric. Dept. Circ. 101: 1–2. *1 fig.* 1920.—*Asclepias galioides.*

1986. Praeger, W. E. **A collection of Sphagnum from the Douglas Lake region, Cheboygan County, Michigan.** Michigan Acad. Sci. Ann. Rept. 21: 237–238. 1919.—The collection of Sphagna was made in order to determine the value of Sphagnum as a surgical dressing. Twenty-six species were found, one of which was first grade dressing material; one was fair, and two were poor but might be used. Samples may be found in the cryptogamic herbarium of the University of Michigan for reference in any future study of the subject.—*Bertha E. Thompson.*

1987. Rock, J. F. **The poisonous plants of Hawaii.** Hawaiian Forester and Agric. 17: 59–62. 1920.—Twelve species are given as being internal poisons, of which four are native to the Territory, the remainder being introduced forms. Recognition characters are given in each case. The native plants included are Akia (*Wikstroemia* spp.), Auhuhu or Hola (*Tephrosia piscatoria*), Kikania (*Solanum* spp.), and Kukui, (*Aleurites moluccana*). The first two of these are employed by the natives to stupefy fish. Both also are poisonous to stock. The introduced plants include common Night Shade, Jimson Weed, Castor Oil Bean, Poinsettia, and Oleander.—*Stanley Coulter.*

1988. Rock, J. F. **The poisonous plants of Hawaii.** Hawaiian Forester and Agric. 17: 97–100. 1920.—This concluding portion of Dr. Rock's article includes thirteen additional plants as poisonous. Most of them are introduced, and most of them are easily recognized.—*Stanley Coulter.*

1989. Russell, G. A. **A machine for trimming camphor trees.** U. S. Dept. Agric. Dept. Circ. 78: 3–8. *4 fig.* 1920.—Discussion of mechanism for harvesting camphor material, and description of the machine for trimming camphor trees.—*L. R. Hesler.*

1990. Scott, W. R. M., and E. J. Petry. **Correlation of variation in resin content of Podophylum with certain habitats.** Michigan Acad. Sci. Ann. Rept. 21: 225–231. 1919.

1991. Tommasi, G. **Ricerche sull'Henna (Lawsonia inermis L.) Sulla costituzione chimica del Lawsone. [Researches upon Lawsonia inermis L. and upon the constitution of Lawsone.]** Gazz. Chim. Ital. 50: 263–272. 1920 (Part I).—The powdered leaves of *Lawsonia inermis* L. from Tripoli, Africa, were extracted with cold water, and the extract was treated with lime water, strongly acidified with HCl, and extracted with ether. Treatment with lime water and strong shaking over ether allow the water layer to assume a strong red-orange coloration. Solution of the product and subsequent additional extraction with ether in strongly acid solution further purify the substance. The compound obtained after numerous extractions and purifications is named by the author "Lawsone." It has a M.P. of 192–195°C., is decomposed at this temperature, and has a M.W. of 174.05, an empirical formula of $C_{10}H_6O_3$, with an elementary composition on analysis of C — 68.95; H — 3.48; O — 27.57 per cent. The structural formula appears to be that of a 2-oxy-1-4-naphthaquinone. It may be used as a dye for wool, silk, and leather.—*A. Bonazzi.*

1992. Viehoever, Arno. **Commercial hydrastis (goldenseal).** Jour. Amer. Pharm. Assoc. 9: 779–784. *1 fig.* 1920.—A report on the analyses of a number of samples of hydrastis collected in various states of the U. S. A., giving moisture content, alkaloidal content, total ash and acid insoluble ash content. From the results obtained the author suggests that the required minimum alkaloidal content of hydrastis be raised to 2.75 per cent of ether-soluble

alkaloids, and that a maximum of 8 per cent be established for total ash and 3 per cent for acid insoluble ash. The rhizome portions were found to have a higher alkaloidal content than the roots, thereby confirming a previous report in literature,—*Anton Hogstad, Jr.*

1993. Youngken, H. W., and C. F. Slotter. **Studies on commercial varieties of nux vomica.** Amer. Jour. Pharm. 92: 538–540. 1920.—A discussion as to some means of distinguishing between a number of varieties of nux vomica; namely, Tellicherry, Madras, Cochin and Ceylon. The descriptions include the outer morphological characteristics, specific gravity, and measurements of the hairs and the outer endosperm cells.—*Anton Hogstad, Jr.*

# PHYSIOLOGY

B. M. Duggar, *Editor*

Carroll W. Dodge, *Assistant Editor*

## DIFFUSION, PERMEABILITY

1994. Girard, Pierre. **Relation entre l'état électrique de la paroi de la cellule et sa perméabilité à un ion donné. [Relation between the electrical state of the cell membrane and its permeability to a given ion.]** Compt. Rend. Acad. Sci. Paris 169: 94–97. 1919.

1995. Shull, C. A. **Absorption of gold.** [Rev. of: Williams, Maud. **Absorption of gold from colloidal solution by fungi.** Ann. Bot. 32: 531–534. 1918. (See Bot. Absts. 2, Entry 194.)] Bot. Gaz. 68: 392. 1919.

## MINERAL NUTRIENTS

1996. André, G. **Répartition des éléments minéraux et de l'azote chez le végétal étiolé. [The distribution of the mineral elements and the nitrogen in etiolated plants.]** Compt. Rend. Acad. Sci. Paris 167: 1004–1006. 1918.—Kidney beans were grown for twenty-five days. Analysis showed about two-thirds of the lime and one-third of the sulphur present in the cotyledons. Nearly three-fourths of the nitrogen and phosphorus were present in the roots and stems, while the magnesium and potassium were approximately in equal proportions in cotyledons and roots and stems.—*G. M. Armstrong.*

1997. Coupin, Henri. **Sur l'absorption des sels minéraux par le sommet de la racine. [On the absorption of mineral salts by the root tip.]** Compt. Rend. Acad. Sci. Paris 169: 242–245. 1919.—The plants employed were peas, castor-oil plant, and lupine. Tips of seedlings were dipped in Knop's solution and in distilled water. Differences in growth indicated that nutritive salts were absorbed through the root tip in the first case.—*V. H. Young.*

1998. Gautier, Armand, and P. Clausmann. **Action des fluores sur la végétation: B. Cultures en champ d'expériences. [Action of fluorides on vegetation: experimental cultures.]** Compt. Rend. Acad. Sci. Paris 169: 115–122. 1919.—Preliminary experiments with artificial media containing compounds of fluorine were not entirely conclusive, but later experiments with the somewhat soluble calcium fluoride, added to ordinary soil, gave interesting results. In its natural state this soil contained 88 mgm. of fluorine per kgm. Calcium fluoride was added at the rate about 56 grams per square meter on small plots, and adjacent plants received chalk containing an equal amount of calcium. The following crop plants were used: wheat, oats, barley, carrots, turnips, potatoes, beets, kidney-beans, peas, cabbage, poppies, etc. In most cases a marked increase was to be noted, although in a few cases the results gave an indifferent or even a lower yield. The authors believe that fluorine accompanies phosphorus in plant tissues and seems to assist in its fixation in plant tissues. Since phosphorus is so important in stimulating the growth of plants, it is believed that the use of fluorides on soils promises to be of great benefit. Fluorine from vegetable tissues does not appear to be assimilated by animals, but is excreted directly.—*V. H. Young.*

## PHOTOSYNTHESIS

1999. Ravenna, C. **Sulla formazione dell'amido nelle piante verdi. [Starch formation in green plants.]** Gazz. Chim. Ital. 50: 359–361. 1920.—This is an answer to some criticisms and misunderstanding regarding previous work of the author on the subject. Pollacci (Atti dell'Istit. Bot. Univ. Pavia Ser. 2. Vol. 17: 29. 1917) questions the value of experiments on the basis of lack of experimental controls, and in the present note Ravenna points to the value of and interpretation to be given to the controls which he had established in his work.—*A. Bonazzi.*

2000. Saunders, J. T. **A note on photosynthesis and hydrogen ion concentration.** Proc. Cambridge Phil. Soc. 19: 315–316. 1920.—Slight variations in hydrogen-ion concentration in shallow water is due to photosynthetic activity of plants present.—*Michael Levine.*

2001. Smith, A. Malins. **The temperature coefficient of photosynthesis: a reply to criticism.** Ann. Botany 33: 517–536. *2 fig.* 1919.—The author analyses the criticism in three papers which have appeared recently discussing current conceptions respecting photosynthesis and the relation of environmental factors to this process. All three criticisms appeared in the Philippine Journal of Science, two being by Brown and Heise, and one by Brown, —*B. M. Duggar.*

## METABOLISM (GENERAL)

2002. Bourquelot, Em., and M. Bridel. **Recherche et caractérisation du glucose dans les végétaux, par un procédé biochimique nouveau. [The detection of glucose in plants by a new biochemical process.]** Compt. Rend. Acad. Sci. Paris 170: 631–635. 1920.—A new method is described which constitutes an absolutely diagnostic test for glucose and allows quantitative determinations to be made. The solution or extract of tissue to be tested is mixed with methyl alcohol and emulsin. A methyl glucoside is formed which may be crystallized out by evaporating the solution to dryness *in vacuo* and boiling the residue with acetic ether; the glucoside crystallizes upon cooling. It is laevorotary. A study is made of known mixtures of sugars to make sure that glucose is the only one involved in this reaction. Some plant tissues are also studied.—*C. H. and W. K. Farr.*

2003. Posternak, S. **Sur la synthèse de l'ether hexaphosphorique de l'inosite et son identité avec la principe phospho-organique de réserve des plantes vertes. [On the synthesis of hexa-phosphoric ether of inosite and its identity with the phospho-organic principles of green plants.]** Compt. Rend. Acad. Sci. Paris 169: 138–140. *1 fig.* 1919.—Hexa-phosphoric ether of inosite was prepared synthetically and found to be identical with the phospho-organic reserve of green plants.—*V. H. Young.*

2004. Woo, M. L. **Chemical constituents of Amaranthus retroflexus.** Bot. Gaz. 68: 313–344. *11 fig.* 1919.—There is a large amount of nitrate in the organs of *Amaranthus retroflexus*, especially in the stem and branches. The rate of nitrate absorption increases with age. This high capacity for nitrate absorption and storage must be an important factor in competition with cultivated plants, since nitrate deficiency so commonly limits crop production. The carbohydrates and nitrogen compounds fluctuate throughout the growing period in inverse ratio to one another. The seeds contain much more organic than inorganic phosphorus. The distribution of nitrogen in the seeds is in the same order as that of the phosphorus. The predominating sugars in the seeds are the polysaccharides. The presence of nitrogen and phosphorus in the lipin fraction indicates that the seeds contain phosphatides.—*H. C. Cowles.*

## METABOLISM (ENZYMES, FERMENTATION)

2005. Willaman, J. J. **Tyrosinase of fungi.** [Rev. of: Dodge, C. W. **Tyrosin in the fungi: chemistry and methods of studying the tyrosinase reaction.** Ann. Missouri Bot. Gard. 6: 71–92. 1919. (See Bot. Absts. 4, Entry 1446.)] Bot. Gaz. 68: 392. 1919.

## GROWTH, DEVELOPMENT, AND REPRODUCTION

2006. Besredka, A. **L'oeuvre de Metchnikoff sur la sénescence. [The work of Metchnikoff on senility.]** Bull. Inst. Pasteur 17: 209–223. 1919.—This is an extract from the book by Besredka which is published under the title: **Histoire d'une idée.** It covers the whole activity of Metchnikoff in the broader zoological phase of the subject and therefore contains material of interest to the physiologist. The great importance to be ascribed to phagocytosis in pathological conditions and in senility is here emphasized, but the secondary nature of this phenomenon is insisted upon. The rôle of intoxicating agents is treated, and the function of the intestinal flora in intoxication is discussed in the light of the work issuing from the laboratory of Metchnikoff on the subject of aseptic life.—*A. Bonazzi.*

2007. Bessey, E. A. **The effect of parasitism upon the parasite—a study in phylogeny.** Michigan Acad. Sci. Ann. Rept. 21: 317–320. 1919.—See Bot. Absts. 6, Entry 1934.

2008. Friesner, Ray C. **Periodicity of elongation and cell division.** (Preliminary note.) Michigan Acad. Sci. Ann. Rept. 21: 233–234. 1919.—Roots of *Curcurbita Pepo, Lupinus albus, Pisum sativum, Zea everta, Vicia faba,* and *Allium cepa* were used. Elongation occurs usually in waves three hours apart. There are also secondary waves from two to four in number every 24 hours. Maximum elongation alternates with maximum cell division.—*Richard de Zeeuw.*

2009. Harlan, Harry V., and Stephen Anthony. **Development of barley kernels in normal and clipped spikes and the limitations of awnless and hooded varieties.** Jour. Agric. Res. 19: 431–472. *13 fig.* 1920.

## GERMINATION, RENEWAL OF ACTIVITY

2010. Green, Frederick J. **Germinative capacity of pine seed.** Quart. Jour. Forest. 14: 140–141. 1920.—See Bot. Absts. 6, Entry 554.

## RADIANT ENERGY RELATIONS

2011. Coupin, Henry. **Sur le temps que la chlorophylle met à se developper à son maximum d'intensité à la lumière. [On the time required for chlorophyll to develop to its maximum intensity in light.]** Compt. Rend. Acad. Sci. Paris 170: 753–754. 1920.—This is a continuation of the previous studies appearing on page 403 of this volume. A determination is made of the exposure to diffuse light required in order that etiolated seedlings may become as green as those grown in light. It is found, for example, that the leaves of sugar corn require only one day, whereas the hypocotyl of chicory requires fifteen days.—*C. H. and W. K. Farr.*

2012. Harvey, E. Newton. **The nature of animal light.** *182 p., 35 fig.* J. B. Lippincott Co.: Philadelphia, 1920.—While this book deals with luminescence in animal forms, it is of general interest to physiologists and at the same time includes also a list of luminous organisms including both animal and plant forms.—*B. M. Duggar.*

## TOXIC AGENTS

2013. Coons, G. H., and Genevieve Gillette. **Phenol injury to apples.** Michigan Acad. Sci. Ann. Rept. 21: 325–329. *Pl. 14.* 1919.—See Bot. Absts. 6, Entry 1938.

2014. Coons, G. H., and H. H. McKinney. **Formaldehyde injury to wheat.** Michigan Acad. Sci. Ann. Rept. 21: 321–324. 1919.—See Bot. Absts. 6, Entry 1939.

2015. Crocker, William. **Zinc and growth of Aspergillus niger.** [Rev. of: Steinberg, R. A. **A study of some factors influencing the stimulative action of zinc sulphate on the growth of Aspergillus niger. I. The effect of the presence of zinc in the cultural flasks.** Mem. Torrey Bot. Club 17: 287–293. 1918. (See Bot. Absts. 1, Entry 744.)] Bot. Gaz. 68: 391–392. 1919.

2016. Rigg, George B., and T. G. Thompson. **Colloidal properties of bog water.** Bot. Gaz. 68: 367–379. 1919.—Bog water gives a precipitate on standing a few hours after saturation with electrolytes, or upon standing a year or more without electrolytes. The filtrate from the precipitation with $(NH_4)_2SO_4$, when dialyzed until free from sulphates, is not toxic to the root hairs of *Tradescantia* cuttings; bog water, when dialyzed for the same length of time as this filtrate, is toxic to these root hairs. The distillate from bog water gives no precipitate with electrolytes, is much less acid than bog water, and is not toxic to these root hairs. The concentrate obtained when bog water is distilled to approximately one-sixth of its original volume gives a heavier precipitate with electrolytes than does bog water; it is also more acid and toxic to these root hairs. The residue from complete evaporation of bog water is a brownish powder which is soluble in cold water; insoluble in alcohol and gasoline, and practically insoluble in ether; this water solution of the residue is toxic to the root hairs of *Tradescantia*. No solid matter was thrown out of bog water by centrifuging. Chemical analyses of Puget Sound bog waters give results similar to those reported for other American bog waters. The toxicity of bog waters to *Tradescantia* cuttings seems to be connected with the matter in it that is in a colloidal state. The oxidation of this toxic matter to non-toxic matter seems to be a basis of agricultural practice in bringing bog lands into cultivation.—*George B. Rigg and T. G. Thompson.*

2017. Schreiner, Oswald, B. E. Brown, J. J. Skinner, and M. Shapovalov. **Crop injury by borax in fertilizers.** U. S. Dept. Agric. Dept. Circ. 84. *35 p. Fig. 1–25.* 1920.—See Bot. Absts. 6, Entry 1431.

## MISCELLANEOUS

2018. Roberts, Herbert F. **An improved colorimeter for color inheritance study.** Plant World 22: 262–269. *4 fig.* 1919.—Improvements of the tintometer are described and illustrated. The instrument is said to be especially valuable in quantitative measurement of color value in flowers, in a study of color inheritance, as in determining the color value of segregates, and in quantitative color determinations generally.—*C. A. Shull.*

# SOIL SCIENCE

J. J. Skinner, *Editor*

F. M. Schertz, *Assistant Editor*

## GENERAL

2019. Free, E. E. **The utility of soil surveys.** [Rev. of: Pendleton, Robert Larimore. **Are soils mapped under a given type name by the Bureau of Soils method closely similar to one another?** Uni. California Publ. Agric. Sci. 3: 369–498. 1919.] Plant World 22: 272–274. 1919.

2020. Gardner, Frank D., asst. by R. M. Blasingame. **Soils and soil management.** *6 × 9 inches, 223 p., 97 fig.* John C. Winston Company: Chicago and Philadelphia, 1920. A non-technical manual on the management of soil for the production and maintenance of fertility, with a section on farm building and equipment.—*J. J. Skinner.*

2021. Grumert, Artur. **Anleitung zur Dranage.** [**Guide to drainage.**] Landw. Hefte 39 and 40: 5–66. *1 pl., 38 fig.* 1919.—A comprehensive treatise on the theory and practice of agricultural drainage.—*C. V. Piper.*

2022. Kühr, C. A. H. von Wolzogen. **Het zure bibitrot bij het suikerriet.** [**Sour cutting-rot of sugar cane.**] Arch. Suikerindust. in Nederlandsch-Indiè 28: 703–756. *24 fig.* 1920.—See Bot. Absts. 6, Entry 1948.

2023. Stead, Arthur. **The agriculture and soils of the Cape Province.** Jour. Dept. Agric. Union of South Africa. 1: 351–358. 1920.

2024. Weir, W. W. **Productive soils.** *6 × 9 inches, 398 p., 235 fig.* J. B. Lippincott Co.: Philadelphia and London, 1920.

## METHODS

2025. Hibbard, R. P., and S. Gershberg. **The biological method of determining the fertilizer requirement of a particular soil or crop.** Michigan Acad. Sci. Ann. Rept. 21: 223-224. 1919.—See Bot. Absts. 6, Entry 1419.

2026. Lipscomb, G. F., C. F. Inman, and J. S. Watkins. **The determination of borax in fertilizer materials and mixed fertilizers.** Amer. Fertilizer 52: 57-8. 1920.—The method described is similar in its general procedure to that outlined in following Entry 2027, but differs in the means adopted for removing ammonia, phosphates, etc. An aliquot corresponding to 1 g. of the sample is made alkaline with sodium hydroxide and boiled down nearly to dryness, and then diluted with water and the same operation repeated twice. The residue is taken up in dilute hydrochloric acid, the solution made alkaline with lime water, and filtered without boiling. The filtrate is evaporated to dryness and ignited to destroy organic matter, the residue taken up in a little dilute hydrochloric acid, made alkaline with sodium hydroxide, and the addition of lime repeated to insure complete removal of phosphates. The borax remains in the filtrate and may then be determined by titration.—*W. H. Ross.*

2027. Pope, W. B., and William H. Ross. **Qualitative method for the detection of borax in mixed fertilizers.** Amer. Fertilizer 52: 65-66. 1920.—Directions are given for a simple qualitative test for differentiating between fertilizers containing less than 0.1 per cent of borax, the limit set by the Dept. of Agriculture for the maximum allowable in a fertilizer without labeling, and those which contain in excess of this amount. The test is made on a 2 g. sample. This is digested with 50 cc. of 90 per cent alcohol; an aliquot of the clear solution is made alkaline with sodium hydroxide and evaporated to dryness. The residue is ignited to destroy organic matter and then taken up in dilute hydrochloric acid; 1 cc. of tincture of curcumin added, and the mixture is again evaporated to dryness, in a porcelain dish. If borax is present a pink coloration, varying in intensity with the amount, will be deposited on the bottom and sides of the dish. By comparing the color given by an unknown sample with a set of samples containing known amounts of borax, it is possible to apply the method quantitatively in the analysis of samples containing in the neighborhood of 0.1 per cent of borax or less. Nitrates interfere with the test and must be destroyed when present. This may be done by adding sufficient sucrose to insure complete decomposition of the nitrates when the evaporated residue is ignited.—*W. H. Ross.*

2028. Ross, William H., and R. B. Deemer. **Methods for the determination of borax in fertilizers and fertilizer materials.** Amer. Fertilizer 52: 62-65. 1920.—The procedure recommended for the determination of borax varies with the nature of the material to be analyzed. In the case of mineral salts free from phosphates, or iron and aluminum salts, ammonia, and organic matter, it is possible to determine borax by driving off carbon dioxide from the solution of the salt, making neutral to methyl red and then titrating after adding phenolphthalein as indicator and 1-2 g. of mannitol, with standard sodium hydroxide solution to a permanent pink color. Phosphates, or iron and aluminum salts and ammonia interfere with the determination and the method must therefore be modified to bring about their removal when present. This may be done by adding to the hot solution of the material to be analyzed 15 cc. of a 10 per cent barium chloride solution and sufficient barium hydroxide to give an alkaline reaction. The solution is then boiled for 15 minutes, or until any ammonia present is expelled, filtered and the borax then determined in the filtrate by titration with standard alkali. Soluble organic matter when present interferes in the determination of small amounts of borax (less than 0.5 per cent) and may be removed by evaporating the filtrate from the barium chloride-barium hydroxide precipitate and igniting. The residue is taken up in dilute hydrochloric acid and the addition of barium chloride and barium hydroxide repeated to insure complete removal of phosphates, etc. In the analysis of fertilizers containing in excess of 0.5 per cent of borax, the removal of organic matter may be unnecessary, and the same procedure may then be followed as for the determination of borax in mineral salts.—*W. H. Ross.*

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

2029. Anonymous. **List of staffs in botanical departments at home, and in India and the colonies.** Kew Bull. Misc. Inf. [London] Appendix 1919: 25–39. 1919.

2030. Gilmore, Melvin Randolph. **Uses of plants by the Indians of the Missouri River region.** Ann. Rept. Bur. Amer. Ethnology [Washington, D. C.] 33: 45–154. 1919.

2031. Hart, W. E. **The botanic garden of Pamplemousses.** Kew Bull. Misc. Inf. [London] 1919: 279–286. *Pl. 9–10.* 1919.

2032. Saunders, C. F. **Useful wild plants of the United States and Canada.** *vi + 275 p.* R. M. McBride & Co.: New York, 1920.

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